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The Slate Interest.

THE subject of slate quarrying and the interest as a business, is more neglected by the press of the country, in proportion to its importance than any other. We purpose, hereafter, to give more attention to this subject, and as the first steps in this direction, present the following sketch compiled from all the sources of information we have within reach at present. We are aware of the incompleteness of our data, and wish those directly interested in bringing this growing interest more to public attention, and who may be posted upon the subject would furnish us with such facts as they may have at command, for publication hereafter.

The slate industry of the United States is comparatively in its infancy. Though we have vast deposits of this useful stone in various parts of the country, some of which have been known for many years, yet it is only within a few years that they have been worked to any considerable extent. Their development has, however, been very rapid, and this branch of business seems in a fair way to grow to a size proportionally as large as that abroad. In the earlier periods of our country's history, all the slate for roofing purposes was imported from Wales, the extensive quarries of which were then able to more than supply the home demand. In that pre-revolutionary period, roofing slate came over to the colonies at a very small rate of freightage-cost, as ballast for sailing vessels, just as now large quantities of copper ore are taken in ballast from the Pacific coast, around Cape Horn, to the metallurgical works of Swansea, in the south of Wales. But the discovery of good slate-beds and their successful development has practically put an end to the importation of slate into this country.

What is generally known as the slate region of Vermont consists of a belt of country lying about midway between the Hudson River, on the west, and the foot-hills of the western slope of the Green Mountain range on the east. A strip of land twenty miles long, and three or four in width, having Poultney, Vt., for its centre, would cover all the quarries of any value that have been opened. This belt lies, in fact, partly in Vermont, and partly in New York. It is about sixty miles from Troy, and about nine or ten from the foot of Lake Champlain. The slate formation itself is much more extensive than this, extending the whole length of the slate. This deposit of argillaceous rock belongs to what is known in the records of geological history as the Devonian period, and, consequently, occupies a very low position in point of time in the scale of geological formations. This slate formation has an average strike, say, of north fifteen degrees east, with a very varying dip eastward, ranging from about fifteen to fifty-five degrees. The stratification of the beds is not, of course, uniform throughout. At some points it is very irregular, and herefore not adapted to the manufacture of good roofing-slate; at others, it is remarkably even, and affords material in almost inexhaustible quantities for slate of the very best quality. There does not seem to be a very large admixture of foreign mineral matter accompanying the slate-beds. Of those that are found, however, may be mentioned veins or threads of calk spar or carbonate of lime, quartz, and now and then traces of iron pyrites, either in an arborescent or crystalline form. The former cut across the planes of stratification of the slate-rock, and are often so numerous as to render the slate-beds wholly worthless, in so far as the manufacture of roofing-slate is concerned; but, fortunately, these veins are only of local occurrence, and quite limited in extent, so that, when, in the working of a quarry, they are encountered, they are considered an evil to be got rid of at a greater or less cost, rather than a permanent obstacle in the way of the further development of the property.

There are now some eighty or a hundred different slate-quarries in process of working upon this slate tract, which, for the sake of clearness, may be divided in accordance with their geographical position into distinct groups. Commencing at the south, we have in Washington county, N. Y., what may be callen the Middle Granville group. This group consists of about a dozen quarries, now being worked. They are all devoted to the manufacture of roofing-slate, with the exception of one.

The predominant colors of the slate manufactured in this district are red, purple, green, and variegated. Considerable pyrites is found—more here, perhaps, than in any of the other districts. It is well worthy of mention, that in this group are located the only quarries of red slate to be found in the country, if not in the world. The slates obtained from it are of the very best quality, being very smooth, fine-textured, and unchangeable in color. They are used only for ornamental work, in connection with the purples and greens; and, on account of their scarcity, bear in the market nearly double the price of the ordinary colored slates. We are told that the slates from these quarries are prized so highly for ornamental purposes, that orders for them have, from time to time, been received from England. Middle Granville, upon the railroad from Troy to Rutland, is the point of shipment for the slate production from this district.

To the northward from the Middle Granville group, and also in Washington county, N. Y., is situated what may be termed the Jamesville and Hampton group. These are very irregular, both as regards color and quality. Mottled green, perhaps, predominates. As to texture, this group furnishes, upon the whole, a finer grained slate than the Middle Granville quarries. The slate from this circle of quarries is shipped at Poultney, Vt., on the line of the above-mentioned railway.

The third group in order, going towards the north, which is the most extensive of all, may properly be called the Poultney group. It is situated in the State of Vermont. There are here about thirty quarries being worked, and devoted, for the most part, with the exception of the Eagle quarry, to the manufacture of roofing-slate. From the quarries of this Poultney group the finest roofing-slate in America is, perhaps, produced. The great body of them consist of fast-colored purples and greens. The stock from which they are made is very fine-grained—in fact, as good as any that the country affords. A large number of slate are made from these quarries. They are sent to the market, in greater part, from Hydeville, about midway between Whitehall and Rutland, on the Rensselaer and Saratoga railroad. This may be considered the chief group in importance, as it is the central one in position, of all the quarries in this slate region.

North-westerly from the Poultney group, in the town of Fair Haven, there are some ten or twelve quarries. Some of the stock quarried from them is manufactured into roofing-slate, and some of it sold at so much per foot to neighboring mills, in which it is manufactured into billiard-beds, mantels, tiling, etc. Finally, we come to the Castleton quarries, which form a group lying to the eastward, rather, of the Fair Haven quarries. There are but few quarries in this locality, the stock from which is all used for mill purposes. This fact owes its origin to the great degree of softness of the slate-rock, a feature which renders its workings in the mills very easy, while, at the same time, it is a quality which injures it very much in view of its manufacture into roofing-slate. The Castleton quarries make Hydeville, on the Rensselaer and Saratoga road, their point of shipment.

In the first, or Middle Granville group, the Penrhyn and the New York are the only incorporated companies. These are under the control of New York capitalists. The other quarries are owned either by private companies or individuals. In the Jamesville and Hampton group the principal quarries are the Empire, the New York and Baltimore, and the Washington. They are principally owned by New York and Boston capitalists. The other properties here are owned upon individual account. Of the thirty quarries that make up the Poultney group there is but one (the Eagle), and that as fine a slate property as there is in the county, in the hands of an incorporated company. An an index of the generally fine character of the slate formation in this locality, for roofing and other purposes, it may be remarked, that some twenty of these quarries have been opened within the last three years, and nearly all of them are doing well. Among the Fair Haven quarries, the Scotch Hill is the principal. This is in the hands of a Boston company. In the last, or Castleton division, are found, as the more prominent, the West Castleton, Cookville, and Billings

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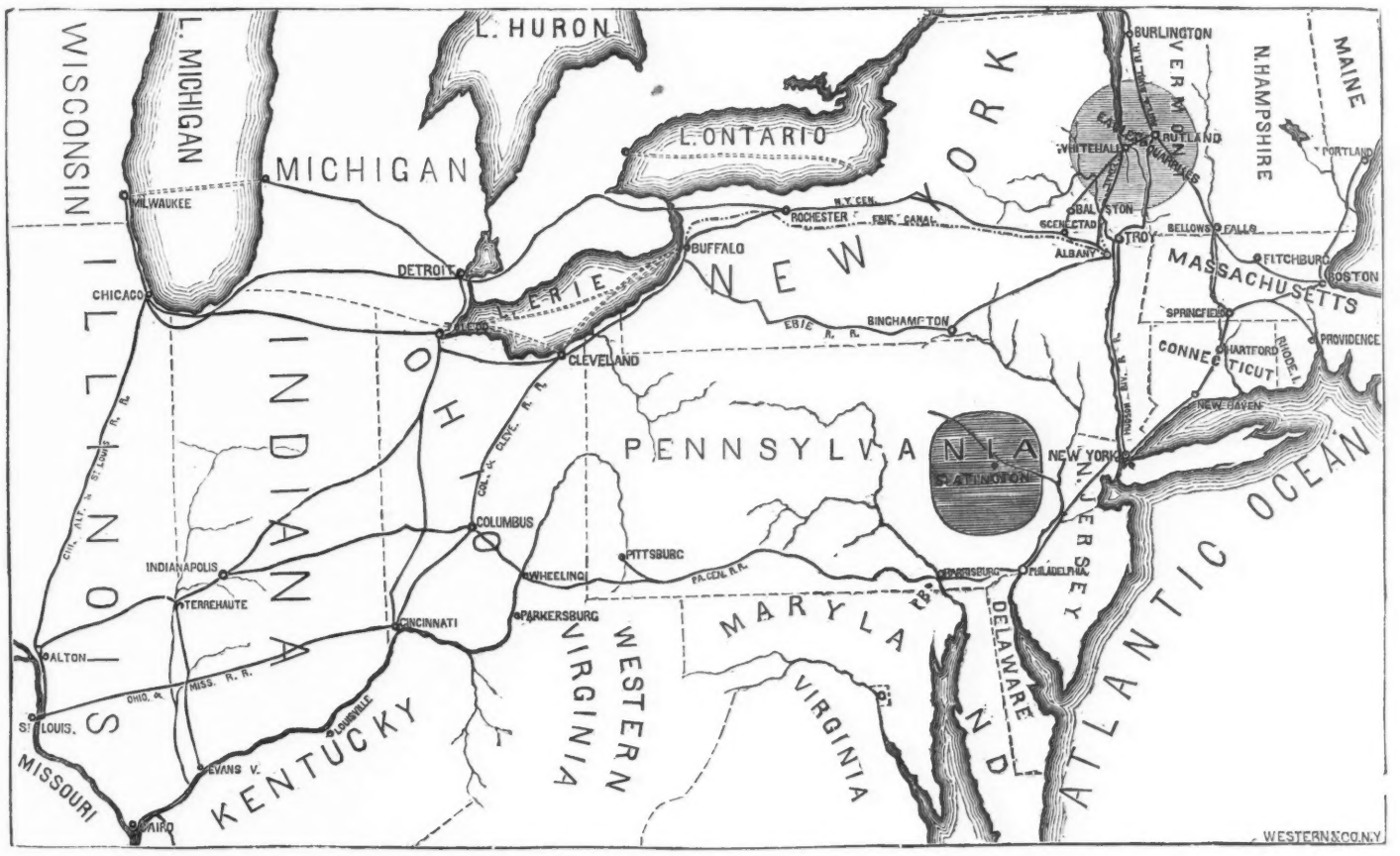

Soda and Salts of Soda.

From the Report of J. LAWRENCE SMITH, U. S. Commissioner to the Paris Exposition.

IT is unnecessary in this place to detail facts upon the manufacture of soda and its salts familiar to chemists and to be found in all works on technical chemistry. Mention will only be made of the more striking results developed during the past few years, especially as exemplified by the Exposition. We purpose to notice the most important of the compounds of soda used in the industrial arts, and whatever may be thought necessary to detail in relation to their manufacture, statistics, etc. There is no substance so well known or so universally in the hands of all as that of soda, either in the form of sal soda and bicarbonate of soda, or in combination forming soap and glass. As the production of sulphuric acid from pyrites was caused by restrictions placed around the introduction of sulphur into various countries, so the present process of manufacturing soda was developed by a similar restriction, but from a different cause. The war in which France was involved in the latter part of the last century created a great scarcity of soda in France. It was imported principally from Spain, where it was made from sea-weed, and by this scarcity attention was drawn to the process of LEBLANC, then recently discovered. The first city in France in which the manufacture was established, viz., Marseilles, is still largely engaged in its production, as well as in the manufacture of its natural offspring, soap.

PROCESS OF LEBLANC—SODA FROM SALT.

It is certainly in place here to refer to the origin and history of the great discovery by LEBLANC, and in doing this I will use the words of HOFMANN and WARD in writing on this subject.

The ever memorable discovery, by the illustrious LEBLANC, of the process now everywhere in use for manufacturing carbonate of soda from common salt, stands distinguished in the annals of industry, not only as by far the most important of all chemico-industrial inventions, but also (a single fact) of having been created perfect. All the other great chemical industries have been slowly worked out by the toil of successive inventors, but LEBLANC's process, the greatest of them all, remains to this day what it was when he first gave it to the world, the best and simplest method of effecting the most valuable of all known transformations. Though eighty-six years have elapsed since this splendid discovery was made, and innumerable researches have been undertaken with a view to its improvement, the original indications of LEBLANC are all but universally followed, with merely a few comparatively unimportant modifications.

It might have been expected that a process which, at its first introduction, was examined by a government commission of thoroughly practical men, and which, after having been submitted to comparative experiments, made with the greatest care, was recommended in an elaborate official report, would have been almost immediately adopted throughout Europe, with proportionate advantage to its discoverer. Such reasonable hopes, if entertained by LEBLANC, were destined to cruel disappointment. LEBLANC himself never reaped the reward of his admirable discovery. This man, who was certainly one of the great benefactors of his race, and to whom, long since, France and England should have joined to raise a statue, lived in poverty and died in despair. The creator of incalculable wealth for his species, he wanted bread himself; and, after endowing man with cheap soda—that is, with the inestimable blessings of cheap glass and soap, cheap light and cleanness, and a hundred collateral advantages—he was suffered, to the shame of Europe, to end his days in a hospital. There he lingered, a wreck in fortune, health, and hope, till reason herself gave way at last, and he perished madly by his own hand. It is to be hoped that with the advance of civilization these terrible tragedies, so frequent in past ages, will become more and more rare, till the future historians of progress shall be spared the pain and shame of recording any more such outrages on justice—such ghastly martyrdoms of genius.

SULPHATE OF SODA.

More than six-tenths of the sulphuric acid manufactured is used in the manufacture of the soda salts. The old method of making sulphate of soda by acting on common salt with sulphuric acid is universally adopted. A fact worthy of note in regard to this salt is, that the French sulphate is much purer than that made in England, which must be owing to the more careful manipulation by the French manufacturers. The French sulphate is of remarkable whiteness, as I have seen in the factory of KUHLMANN, at Lille; the sulphate manufactured there is largely used in Belgium and France for making the finest plate glass. A process of making the sulphate was at one time employed near Liverpool by mixing iron pyrites and salt: the result of the reaction being volatile sesquichloride of iron and sulphate of soda, which last was separated by the aid of hot water.

The principal use of sulphate of soda is to manufacture the carbonate by the process of LEBLANC, which, although over eighty years old, has never been supplanted by any other.

In France and Germany the mother waters of the salines are worked to extract the salts that they contain, and by the process of BALARD. By using carefully regulated temperatures, these salts are crystallized out. The sulphate of soda may be obtained in this manner, but as this salt made by the direct action of sulphuric acid on common salt is obtained more cheaply, the process is not much resorted to. The principal object of treating these mother waters is to extract the potash salts.

The manufacture of soda from salt resolves itself essentially into four operations:

1. Formation of sulphate of soda by decomposing common salt.

2. Heating the sulphate of soda mixed with lime and charcoal in a furnace, to form what is called black-ball.

3. Lixiviation of the black-ball with water, to extract the alkaline products.

4. To obtain caustic soda and carbonate of soda by proper evaporation and concentration of the liquor.

There are two methods by which sulphate of soda is produced, namely, in the moist way in leaden vessels, and by the dry way in furnaces. The former is employed to a very large extent, and must always be used where a pure white sulphate of soda is required. M. KUHLMANN, at Lille, manufactures a large quantity of this description of sulphate, which is afterwards heated in hot chambers and all its water of crystallization driven out, forming a pulverulent mass as white as the driven snow, and used largely by the glass-makers, which could not be done if the decomposition of the salt was conducted in iron vessels. The more common form in England of decomposing the salt in a furnace of a peculiar construction, is fast coming into use everywhere where the sulphate only is used for the subsequent operation of transforming it into carbonate. The process most generally adopted will be described particularly, as it affords a very complete condensation of the hydrochloric acid formed, so much so that the use of this process in Belgium is compelled by law. An account of the furnace as constructed and used in the works of TENNANT & Co., has been given by Professor HOFMANN, and I use his own words in describing it.

As this apparatus is now generally arranged, it consists of a muffle constructed of cast-iron, and a second muffle constructed of brick work. The lower part of the iron muffle represents the segment of a hollow sphere, made of thick cast-iron, nine feet in diameter in its widest part, and one foot and nine inches in depth. This is placed on a seating of brick work, and is surmounted with a cover of cast-iron, also the segment of a hollow sphere, about one foot deep in the centre. This cover has two doors, through one of which the salt is introduced, while through the other the mixture can be passed into the brick muffle. A fireplace is arranged beside the iron muffle, and a flame is passed firstly over the iron cover, and subsequently under the iron pan. The requisite heat is thus given to the contents of the muffle by transmission, and the gas is evolved at a comparatively low temperature unmixed with air. The brick muffle is adjacent to the iron one, both being seated on the same pile of brick work, and having flues which communicate with each other. The brick muffle consists of a chamber about thirty feet long and nine feet wide, having a floor constructed of bricks, which forms the covering of a number of flues; the upper part of this muffle is formed by a thin arch of brick work, which is again surmounted by a brich arch, a flue being thus formed between the two arches. A fireplace is arranged at one end of the brick muffle, the flame of which is first caused to traverse the flue between the two arches of the muffle, and then to return through the flues under the brick floor. Heat is thus applied to the contents of the muffle by transmission through the brick work of its arch and floor.

In using this apparatus, half a ton of salt is thrown into the heated iron muffle, and the requisite quantity of sulphuric acid, of about 1.7, is run upon the salt. The mixture is assisted by the use of the iron rake, and a strong effervescence of hydrochloric acid ensues. The mixture generally thickens, and at the expiration of about one hour and a half, (when about two-thirds of the hydrochloric acid has been driven off) it becomes pasty and ready to be transferred to the brick muffle. This is effected by pushing the pasty mixture through the channel of communication between the two muffles. To complete the expulsion of the hydrochloric acid, it is needful to maintain a red-heat in the brick muffle. A provision is made for closing the communication between the two muffles, so as to have the power of keeping separate the gases proceeding from each, as the gas from the brick muffle will furnish a more concentrated acid, by condensation.

The acid gas that escapes from this furnace is condensed by one of the methods described under the head of hydrochloric acid. Furnaces of the above description have been in use in the works of TENNANT, at Glasgow, for twenty years, decomposing five hundred tons of salt weekly, and with the most perfect success, and no annoyance to the neighborhood by acid vapors.

The second process consists in mixing sulphate of soda with lime and heating it in a furnace. The proportion of these ingredients is not the same in all manufactories; they vary nearly as follows at different places: Sulphate of soda, 100 parts; carbonate of lime, from 121 to 90 parts; coal, from 71 to 35 parts.

These differences arise from the difference in the purity of the materials, some using anthracite coal giving eighty per cent. of solid carbon, others using coal giving only sixty per cent. of carbon, and ten to eighteen per cent. of ash.

KUHLMANN, who uses a coal leaving about four or five per cent. of ash, employs sulphate of soda and carbonate of lime, 100 parts each, and 37.7 parts of coal.

The three ingredients above mentioned are placed in furnaces of different descriptions, fully described in works on technical chemistry; the metals are not pulverized, the coal and lime being thrown in in lumps, as the method of manipulation renders the finished material easier of lixiviation in the next operation.

The only furnace that may be considered as an innovation of the older one, is the English revolving furnace. It has been employed since 1861, and although there was a disposition at first to condemn it, it has gradually grown into favor, and will doubtless soon find its way into France and other continental countries. Mr. STEVENSON describes one of those first erected as follows: It consists of a horizontal cast-iron cylinder, eleven feet long and seven and a half in diameter, lined with nine-inch brick work. Two circular openings, about two feet in diameter in the ends, allow the flame from the furnace to pass through the cylinder and over its contents. The cylinder rests on four rollers, one pair of which is turned by machinery, so as to cause the cylinder to revolve. The charge is introduced from a hopper above, through a door in the middle of the cylinder, and the charge runs out at the same door when the decomposition is completed, the cylinder being stopped for this purpose with the door downwards. No tools being required to turn over the materials, the furnace can be kept closed, its brick lining lasts a long time, and the saving of manual labor is considerable. A revolving furnace of the dimensions given above decomposes one thousand four hundred weight of sulphate of soda every ten hours, at the cost of 43 cents per ton, including wheeling and charging the materials.

This furnace is heated by the products of combustion passing through it from end to end, there being a fireplace at one end of the apparatus and a chimney at the other. At the present time the dimensions of these are made even larger; some of them are seventeen feet long by twelve feet in diameter, into which the carbonate of lime is first introduced in large fragments and the cylinder put in motion slowly, then the sulphate of soda and coal are added, and the motion is accelerated. In such a furnace three tons of matter can be treated at one time. A very active combustion is kept up in the furnace, so that there may be heated flame in the whole length of the cylinder; the excess of heat is not lost, but is used for the evaporating pans, etc. "Black-ash" is the name given to the material as it comes from the furnace, and it is usually made up into balls while still hot. A good deal of this ash is sold at once to the soap-makers, but most of it is lixiviated, and from the solution soda-ash, crystallized soda, and caustic soda are made. As there is no improvement in the beautiful method long employed in England and elsewhere for lixiviation, and which is said to be due to Mr. JAMES SHANKS, of St. Helens, we will not give any details on this subject, but refer those desiring further information to the excellent description of the method to be found in various books. The grand result aimed at and accomplished is the complete washing out of all soda from the black-ash with the least quantity of water.

The black-ash compound consists essentially of carbonate of soda and sulphide of calcium, but then there are various other substances in small quantities arising from impurities in the ingredients, or from imperfect decomposition. When treated with water, this compound yields considerable caustic soda; this, however, is not supposed to be in the ash, but to be produced by the action of water in the presence of the oxysulphide of lime that is converted into carbonate of lime and sulphide of calcium.

CAUSTIC SODA FROM BLACK-ASH.

It has been stated that some of the carbonate of soda formed in the furnace operation is converted into caustic soda by the treatment of the ash with water. Formerly it was the habit either to dry the mixed soda mass and send it to market as soda ash, or to convert it into carbonate of soda and crystallize it as soda crystals, but for several years much of this soda has been sold as caustic soda, especially since the adoption of GOSSAGE's process of separating the caustic soda simply by a judicious process of evaporation. Although this method has been employed for some time on an extensive scale, it is thought advisable to give a condensed description of it from the Exposition report for 1862, particularly as time has approved its value. The crude liquors obtained by exhausting black-ash are evaporated to a considerable degree of concentration, so as to separate a greater part of the carbonate, sulphate, and chloride of sodium. When the liquor has been brought to a specific gravity of 1.5., nearly all the foreign salts are deposited, and there remains in solution caustic soda, a peculiar red compound of sulphide of iron (which has procured for these solutions the name of red liquors), together with small quantities of carbonate, sulphate, chloride, ferrocyanide, and sometimes sulphocyanide of sodium. Chloride of lime or nitrate of soda is now added to oxidize the sulphide, and after concentration to 1.6 specific gravity, at which time more salt is deposited and raked off, it is run into settling vessels and again placed in the evaporators and concentrated, and kept for some time in a state of igneous fusion, when further deposits take place, and when it is concentrated so as to contain about sixty per cent. of anhydrous soda, it is run into sheet-iron vessels with the joints made tight by gypsum. It is closed up firmly and perfectly, and then delivered to commerce, and is used by the paper-maker, soap-maker, and others.

THEORY OF THE MANUFACTURE OF SODA BY LEBLANC'S PROCESS.

Notwithstanding more than eighty years have elapsed since the manufacture of soda by this process, it is only since 1862 that anything like a clear solution of the problem has been propagated—one which seems to have very nearly cleared up all difficulties connected with its explanation.

In the furnace the first change takes place, at a comparatively moderate temperature, when the sulphate of soda is converted into sulphide of sodium. At a higher temperature a reaction takes place between the sulphide of sodium and carbonate of lime, when carbonate of soda and sulphide of calcium are formed, with the escape of carbonic acid; which sulphide of calcium was formerly thought to be soluble, but the insolubility of it when made by fusion is now clearly established. This reaction can be accomplished with an atom each of sulphate of soda and carbonate of lime, with the necessary amount of coal for the deoxidation; but most commonly an excess of lime is added to furnish a larger surface to the fused sulphide of sodium. In order to accomplish more readily the decomposition of the sulphide, an excess of coal is added to increase the temperature of the mass, and it also contributes at the end of the decomposition to transform the excess of carbonate of lime into caustic lime, and when this takes place (and at no other time) carbonic oxide is given off, the escape of which gas is an indication that the operation is at an end; the

porosity of the pasty mass, so useful in the subsequent operation, is brought about by the escape of this last mentioned gas. This mass, which constitutes the black-ash, undergoes new decompositions when brought in contact with the water required to extract the carbonate of soda. In the first action of the water it is found to contain, besides the carbonate of soda, only traces of caustic soda and sulphide of sodium; but as the action of the water is continued, and time is given for the caustic lime to become hydrated, the quantities of the caustic soda and sulphide of sodium increase, with a proportional diminution of the carbonote of soda.

The above may now be considered as the true nature of the changes that go on in the making of carbonate of soda from sulphate of soda.

If the water used in treating the black ash in the vats generally adopted for some time be evap orated, and the dry mass treated in the soda furnace so as to oxidize the sulphide of sodium, we obtain the ordinary soda ash, composed of carbonate of soda, caustic soda, and sulphate of soda; this is productive of some loss, so that another method has been adopted for many years by which the soda value of the ash is increased. In treating the black ash with water, the first portion of the water is strongly saturated with soda salt and caustic soda, containing hardly a trace of sulphide; this portion is evaporated separately, and dried, furnishing a salt almost pure; the last portion of water with which black-ash is treated is a dilute solution of the salts with considerable sulphide of sodium. This solution is treated with carbonic acid, which combines with the caustic soda, and decomposes the sulphide. This last solution is now evaporated to dryness, and furnishes quite a pure carbonate of soda. A still further improvement by Mr. GOSSAGE has been made within the last ten years in the treatment of the solutions for the purpose of furnishing commercial caustic soda, an account of which has been already detailed.

Missouri Iron and Indiana Coal.

CONCLUDED.

Neutral iron is made in the furnace, by mixing in proper quantities the cold-short and red-short ores, and is the most valuable metal for general purposes. The general character of the iron made in Clay county is red-short, but a neutral iron may be made by using the proper mixtures of ores.

No. 1 foundry iron made in Clay county is of a gray color, very soft and highly crystalline; it possesses a high character for foundry purposes, on account of its uniform rate of shrinkage, and the large amount of scrap it will carry, say fifty to sixty per cent., which is from two to three times as much as can be used with either the Hanging Rock or Kentucky iron of the same grade. B 1 gray foundry iron is not so soft as No. 1, but makes a stronger casting; scrap cannot be used with it. No. 2 bluish gray foundry is both a harder and stronger metal than either of the others, but, like the latter, will not admit of being mixed with scrap. No. 1 mill iron, bluish gray, fine-grained pig, used for making bar-iron, nails, etc.; No. 2 mill iron, inclined to be mottled, is also used for making bar iron and nails. White iron is made from the same stock as the latter, but results from a higher heat in the furnace; this is the best iron for making nails, cast-iron bells, and railroad frogs. It is a very hard metal, and wears better than the other grades. Red-short iron loses more carbon and will shrink more in casting than cold-short iron, and in the mill the muck-bars will crack on the edge in rolling, while the bars made from neutral iron will be smooth and perfect on the edge. The market demand for red-short pig is rapidly increasing, owing to its superior strength when cold, and the various uses to which it is applicable. By mixing it in the puddling furnace, with proper proportions of cold-short pig, a neutral iron can be made.

JAMES WATSON, an old furnace-man, states the following as the cost of making iron at Brazil: "Cost of their different ores at Brazil—Iron Mountain, $10 50 per ton; 1¾ of a ton for the metal being $17 00. Their ore for one ton of iron, made out of Iron Mountain or Lake Superior ores, costs them about $1 per ton of iron more; add $9 for coal, and we have $27 00. Well, we have $3 00 left for lime, founders, engineers, keepers, fillers, guttermen, stock, hands' wages, and incidental expenses. There is a large amount of very fine bog ores in North-western Indiana. I saw several hundred tons of it at the Brazil furnaces. It is forty per cent. ore, and the ore for a ton of pig-iron costs the Brazil furnaces about $20. The distance is too great by rail to be brought over a road that requires excessive tariff. The Tennessee ores cost them over $20 to the ton of iron."

Owing to the persistent efforts being made by the anti-protection faction to "bear" the cost of producing pig-iron, questioning the furnace proprietors in regard to it would only render the inquirer subject to the charge of inquisitive meddlesomeness; in other words, the iron men have been so grossly misrepresented, that they prefer to be silent on the subject for the present. But we feel warranted in saying that the Carondelet furnaces can produce iron as cheaply *the year through* as any other furnaces in the United States. We are informed that since the Kingsland furnaces have been using the red oxide and specular ores from along the South Pacific Railroad, they find that by using twenty per cent. of those ores, 100 pounds of coal melt 125 pounds of ore, instead of 150 pounds of coal, which they formerly used to melt 125 pounds of Iron Mountain ore; resulting in a saving of about one-third of fuel used; and their furnace, instead of yielding 35 to 40 tons per day, now averages 60 tons, and has produced as high as 63 tons in twenty-four hours—probably the largest run ever known from a fourteen-feet furnace.

We understand from the same authority (Mr. TAYLOR,) that the furnaces at Carondelet, upon actual experiments, have represented the value of the South-west ores at so high a standard that the Pacific Railroad Company have decided to build a cut-off track from Cheltenham, or in that vicinity, direct to Carondelet, especially for the transporration of the South-west ores to the furnaces, thus obviating the necessity of a transfer by wagons through the city.

At the meeting of the City Council, recently helds a very sensible and comprehensive letter from HUDSON E. BRIDGE, Esq., President of the Pacific Railroad Company, was read, from which we extract the following: "The large iron interest now being developed in mining the softer ores on the South-west branch. so important for mixing with the hard iron of Pilot Knob, and which are now obtained only at great expense by the works at Carondelet, is one of these interests. Large quantities of this ore are now being sent to Indiana. So far as we can afford a cheap outlet to this ore, it will bring to our city and State a moneyed return commensurate with the facilities afforded. It is important to this company to secure its supplies of coal direct from the mines."

The Pacific Railroad Company proposes to construct a track along Popular street, and to operate it between the hours of 11 P. M. and 6 A. M., or at such other hours as may be designated by the Council. Both of the connections above alluded to are greatly needed, and we trust will soon be made.

In the course of his speech at the Indiana banquet, Col. T. J. STAUBER, (Senator from Linn county), among other witty and practical remarks, said: "We have visited your coal fields, and we must say, as said the Queen of Sheba, the half has not been told us. Indiana has great coal fields of the best article, and Missouri has energy and railroads, and we are going to make that coal ours. We need it, and we are going to have it; and we are going to make return for it. We have inexhaustible beds of the finest iron on the face of the green earth; and now, to-night, I move that we make this the wedding feast, and marry your black boy 'Coal' to our brown gal 'Iron.'"

Furnace proprietors state that they want our Missouri ores, and can use them extensively and profitably, even at the present rate of transportation. They consider it now a fixed fact that the chemical constituents of the block coal render it the most economical and valuable for making iron. If their statements are true, (and we have no reason to question them), our Carondelet furnaces will want the block coal. The great drawback now is want of transportation facilities—particularly the cost and delay experienced in getting the ore and coal through the city and across the river. As stated above, projects are now before the proper parties which, when consummated, will remedy this evil to a great extent. In addition, we may state that a St. Louis representative of one of the most extensive and successful coal mining companies, while on the excursion, secured two large tracts of block coal land, and will at once develop them, and it will probably be the policy of the company to build a transfer boat, especially for the transportation of Missouri iron ores in the cars direct to the Indiana furnaces, and to load the cars back with coal—thus saving the expense and delay of handling and transporting either by wagon.

The block coal field is traversed by the Indianapolis and St. Louis railroad, and also by the St. Louis, Vandalia and Terre Haute railroad, (which will be open to business in a few days), thus insuring "healthy competition." The furnaces and principal coal mines are either on the main lines of railroad or connected with them by switches, rendering the railroad facilities in that region all that could be desired. When the contemplated improvements are completed *here*, the Missouri ores can be shipped direct to any furnace, and the coal from any bank can be shipped direct to any of our furnaces; and if we do not mistake the signs of the times, the day is very near at hand when all this will be consummated, and result in the rapidly-increasing development of the great staple minerals of both States, to the mutual profit of all concerned—producers, consumers, and the country at large.

On the Manufacture of Vitriols.

By A. EILERS, Mining Engineer.

II.

THE principal minerals used for the manufacture of copperas are magnetic pyrites, marcasite and common iron pyrites. The conversion of the former two into sulphate of iron is the simplest, because these two are easily decomposed and sulphatized by the air and moisture alone, without requiring any additional assistance from man; the latter requires artificial help by a preparatory roasting.

Copperas, especially the impure article, commands only a low price in the market; and for this reason the operations connected with its manufacture must be carried out on a large scale in order to make profitable returns possible. In making it from magnetic pyrites or marcasite, which abound in all parts of the globe where metamorphic strata crop out on the surface, very large quantities of these minerals are therefore subjected to the necessary manipulations at the same time. The ores are broken into lumps of small size, not larger than hen's-eggs, and dumped upon extensive water-tight floors, in amounts of 300 to 500 tons in a heap. The floors are made impenetrable by evenly spreading several layers of clay, which has been freed from admixed small stones and organic matter as much as possible, over the surface of the ground intended to serve as the floor, and tamping it carefully all over so firmly that, after the operation is completed, the finger cannot make an impression on the clay. The material possesses generally the right amount of moisture for this purpose, when dug out of the ground, but if not, it must be prepared so as to stick together when pressed in the shape of a ball in the hand, without leaving the palm wet or even moist. The floor is made either round, square, or in the shape of a parallelogram, and inclined from all sides towards a point outside; at the same time it is elevated at least a foot above the surrounding surface of the ground. Its lowest point is connected by wooden troughs or pipes, with wooden reservoirs, or settling tanks. Wooden floors would not answer the purpose, because, during the subsequent decomposition and oxidation of the ores, much heat is developed, which sometimes reaches such a height as to set the heaps actually on fire. As soon as the tamping of the clay floor is completed, the broken pyrites may at once be thrown on. The shape of the heaps follows that of the floor, leaving about two feet free all along the outside. Their sides are thrown up as steep as the nature of the material will permit, and their height ought not to exceed seven feet. In this manner, they are left exposed to the weather for some time. Frequent changes of rain and warm weather favor the decomposition and oxidation greatly; and soon cracks will be noticed in the pieces of pyrites; hair-like bunches of crystals will be formed on the outside, and the whole pile will gradually be covered by a white efflorescence of iron vitirol. As soon as this decomposition is found to have progressed for some distance, say two or three feet into the interior of the heap, the lixiviating process is commenced. For this purpose, a suitable scaffolding is erected above the heap, carrying troughs perforated with very small holes in the bottoms and sides. Into these, water is brought and distributed over the heap as equally as possible. It percolates through the mass, slowly dissolving on its way to the impermeable floor the sulphate of iron, and carrying it, mixed with small particles of ore, into the settling tanks. After these have been filled, the solution is pumped back over the heap, and permitted again to penetrate it, dissolving new portions of vitirol. This operation is repeated several times, and finally the liquid is left to settle in the reservoirs. After this, it is drawn off from the sediment, and conducted into concentration vats, (best constructed of masonry) which are arched and heated by means of fire-places at one end, the flame passing over the surface of the liquid. Evaporation is thus materially accelerated by the draft. As soon as the liquid shows 20 per cent. of vitirol, firing is discontinued, and the solution is drawn into large vats to permit the deposition of the basic sulphate of iron, a yellowish brown powder, which is generally formed in considerable quantities. When the liquid has become clear, it is run into a second concentration vat, usually constructed of sheet-lead, arched and heated like those mentioned before. Here the solution is evaporated, until it contains 48 per cent. of vitirol, and after the settling of the basic salt, which is this time formed in less quantity than before, it is drawn over into the crystallization vessels, where large quantities of the vitirol are deposited in from 10 to 14 days, in the same manner as described in a former article. The drying and packing of the vitirol is conducted in the same manner as in the case formerly spoken of, with the only exception, that the best vitrol from the strips of lead, canes, etc., and the inferior kinds from the bottoms and sides, are mixed before packing into the barrels and sold together, because the low price of the vitirol prepared in this manner does not permit re-crystallization of the inferior article. Such copperas contains according to the composition of the ores from which it has been manufactured, from 16 to 24 per cent. of protoxide of iron, combined with sulphuric acid, while the balance consists of the deterioating sulphates of copper, zinc, manganese, alumina, magnesia, etc. Pure copperas would contain 25.9 per cent. of protoxide of iron.

The basic sulphate of iron, deposited during the settling processes and the scum formed on the top of the solutions while evaporating, are heated strongly in reverbaratory furnaces, and converted into red oxide of iron, which is much used as paint, and known as Venetian red.

The mother-liquor is either again concentrated and crystallized for itself, yielding an inferior quality of vitriol, or it is mixed with water and used again for lixiviation of the heaps, after they have been left for several months to form new quantities of sulphate of iron.

Works of this kind, to be kept in continual operation, require a large working area; since many heaps are required to supply without interruption the necessary solutions. It takes, of course, a long time before all the iron in the ore is transformed into sulphate. In some countries such heaps have continued to yield a paying lye for twenty years. The cost of the manufacture is of course extremely small, as no handling of the raw material is necessary beyond its deposition on the lixiviating floors, and the amounts of fuel used, as well as the labor required, are so small that they form but a trifling item in the cost. The main expense in this method lies in the mining of the ore and its breaking to the proper size. It has also been attempted to do away with the expense of the first concentration, by conducting the weak vitriol solution upon thorny brush, in trickling through which it is rapidly concentrated by evaporation, even at the average temperature, since it thus presents the largest possible surface; but the loss in this method by the formation of large quantities of basic sulphate has been found to balance the gain in fuel.

When common pyrites is used as raw material for the manufacture of copperas, it must be submitted to a roasting operation, in order to drive off one equivalent of sulphur; because the bisulphuret of iron is not at all, or but very slowly, decomposed, and subsequently oxidized by atmospheric influences. But after it has been changed by roasting to a sulphuret, decomposition takes place rapidly. It is then treated the same as magnetic pyrites or marcasite,* while the sulphur eliminated during the roasting process is used either for the manufacture of sulphuric acid, or condensed, remelted repeatedly, and cast into moulds to be sold in the form of short bars.

Considerable sulphate of iron is also made in different localities from mine-waters, as, for instance, at Fahlun, (Sweden) Goslar, (Prussia) etc. These waters contain always variable proportions of sulphate of copper, which must be removed

* The case with which marcasite, a bisulphuret, decomposes in the air, without artificial roasting, while the ordinary bisulphuret does not, is a matter not fully explained. The chemical constitution of the two minerals being the same, this difference in behavior is probably due to the different arrangement of molecules, indicated by the different crystal-forms.

before the copperas is crystallized. The solutions as they come from the mine are always very weak, and various designs have been tried to effect concentration at a low rate of expense. At Fahlun gradation-walls of thorns are used, at the Rammelsberg mines the mine-waters are used for the leaching of what is there called "the old man"—the refuse of former mining stowed away in the mine and used for filling in. Now copperas and zinc-vitriol are made out of this material. After the mine-waters are sufficiently concentrated, say to twenty per cent, they are conducted into vats filled with scrap-iron, in order to precipitate the copper from the solution. This effected, they are condensed further, and the copperas crystallized in the manner already described.

The Catastrophe at St. Anthony.

THE dangers that threaten the destruction of the Falls of St. Anthony cannot be explained without a reference to the geology of that section, with which we are personally familiar. There are but two layers or rock deposits at that point—the upper, a blue and comparatively soft limestone, made up almost exclusively of fossils of a remote era; the lower, a bed of clean, angular, but uncemented sand. The bed of the river below the falls is cut through this soft sand rock, and the falls themselves only exist by reason of a thin crust of limestone, forming the river bed for scarcely half a mile up stream, when it thins out entirely, and the stream above that rests directly upon the same sandstone that underlies the river below. It is apparent then that the breaking up of this very limited layer of limestone involves the destruction of the falls. The progress of disintegration must always have been rapid from the time the waters cut through the limestone, since they constantly undermine it, and the river for miles below is full of huge fragments which have fallen into the stream. That the falls were once located at the mouth of Lake St. Croix, forty miles below, will not be doubted by any one given to geological investigation.

Appreciating the danger, the mill owners at Minneapolis and St. Anthony some time since undertook to prevent the breaking away of the limestone, by building an apron from the top of the falls so that the water could slide off, and not fall in a vertical sheet upon the yielding sand below. This project, however, after much money had been expended, did not prove a success. A flood came; the water got under the upper edge of the apron and tore it away, so that the general effect was to hasten the catastrophe. Indeed it would seem as if nothing could avail but to build a solid wall of limestone or granite from the bed of the river up to the limestone, and thus prevent the undermining of the current, which is ceaseless.

To add to the dangers of the situation—and yet for the worthy purpose of multiplying mill sites—some parties, a year or two ago, commenced cutting a tunnel or mill-race from below the falls, carrying it under an island above, directly under the lime rock, with a purpose of putting in bulk-heads and water wheels directly under the river, and thus convert the island into a great manufacturing point. They had no difficulty in shovelling and wheeling out the soft sand rock, and the work was progressing rapidly, when suddenly, last season, the river broke through the thin limestone layer, and at once sought the subterranean channel. The labor of hundreds of men for a long period, and an expenditure of $50,000 failed to close the opening securely, and the floods of this spring have torn out all the work, undermined hundreds of feet of the island, which, with several mills upon it, have tumbled into the vortex and gone to utter wreck. Whether it will be profitable to arrest this destructive breach must be regarded as a matter of great doubt, owing to the soft character of the supporting rock. A small leak even in the river bottom would be sufficient to put any works, however extensive, in utter peril. Yet, if the break is not speedily and effectively stopped, the public may bid good-bye to St. Anthony, for a single year of high water would doubtless undermine the whole falls, and leave a mere rapid where they now stand. Indeed the results of their destruction cannot be estimated, as the sand-rock forming the river bed above the falls would be speedily cut down to the level of the river below, and the effects would be felt far up the stream, perhaps to St. Cloud, where the granite emerges from beneath the sandstone.

The washing away of these falls would be a great calamity to Minnesota. It furnishes more and greater water power than any other point in the State, while the thriving city of Minneapolis and village of St. Anthony have grown up as great manufacturing points. The loss to either would be beyond calculation. But it will require great outlay and labor, and constant care and watching, to preserve the falls for any considerable length of time. The danger is constant and ever present.—*Chicago Republican.*

Cutting up Large Iron Shafts.

THE Buffalo correspondent of the New York *Tribune* writes: "It is frequently very difficult to break up great shafts of cast-iron when necessary to prepare them for the furnace. Old cannon have, therefore, sold low. Upon some, powder and nitro-glycerine have been tried in vain. Some have been burst by ice, others by wedges driven by machinery, or long-continued hard labor, into the muzzle. Here they are cut in two by a continuous stream of molten iron, which wears away the iron as a stream of hot water would eat into a mass of ice. The gun is rolled upon a frame in front of and level with the furnace mouth. Then the muzzle end is shoved in as far as possible among other iron, the opening filled up and luted around the gun, the end of which is melted off. At the next charge it is shoved in another length, and is thus reduced until the breach can finally be rolled in, and thus finished without any more expense than with pig or scrap iron.

The New Mint Law.

WE have received, and commence this week to furnish to our readers, in advance of the official publication, the Report of Hon. JOHN JAY KNOX, Deputy Comptroller of the Treasury, upon the Mints, Assay Offices, and Coinage of the United States. This Report accompanies the draft of a bill, the contents of which are sufficiently explained in the Report itself. We will only say at present that Mr. KNOX is high authority—that his views upon this subject are strengthened by the concurrent opinion of numerous distinguished experts, and that we join with the Secretary of the Treasury in recommending the passage of the bill "in its present form." It would be better to reject it entirely than to so tinker and modify it as to disturb its present well-proportioned completeness.

MINING SUMMARY.

Nevada.

QUARTERLY EXHIBIT OF THE COMSTOCK MINES.

We are indebted to the San Francisco *Commercial Herald* for the following statistics of the Comstock mines: The aggregate assessments and dividends of the claims located on the Comstock lode for the first three months of the past five years have been as follows:

First quarter, 1870	Assessments	$734,000
First quarter, 1870	Dividends	220,000
First quarter, 1869	Assessments	156,200
First quarter, 1869	Dividends	588,000
First quarter, 1868	Assessments	557,500
First quarter, 1868	Dividends	310,000
First quarter, 1867	Assessments	230,780
First quarter, 1867	Dividends	790,000
First quarter, 1866	Assessments	474,600
First quarter, 1866	Dividends	90,000

We herewith present a condensed tabular statement relative to the product of bullion, dividends and assessments, of the various mines on the Comstock lode during the first three months of 1870, together with the aggregates of the same period during the four preceding years:

COMPANY.	Bullion Product.	Dividends.	Assessm'ts.
Belcher	$99,474	.....	.....
Bullion	.....	.....	$10,000
Caledonia	13,796	.....	.....
Chollar-Potosi	319,997	84,000	.....
Consolidated Virginia	.....	.....	23,200
Crown Point	49,172	.....	90,000
Daney	.....	.....	8,000
Empire Mill and Mining Co	.....	.....	12,000
Gold Hill Q. M. & M. Co	5,802	.....	.....
Gould & Curry	101,841	.....	72,000
Hale & Norcross	440,594	96,000	.....
Imperial	.....	.....	40,000
Julia	.....	.....	6,000
Justice	.....	.....	36,000
Kentuck	92,297	40,000	.....
Lady Bryan	.....	.....	12,000
Ophir	.....	.....	84,000
Overmann	178,842	.....	.....
Savage	55,625	.....	160,000
Segregated Belcher	.....	.....	12,800
Sierra Nevada	38,925	.....	.....
Yellow Jacket	375,000	.....	168,000
In 1870	$1,769,365	$220,000	$734,000
In 1869	2,040,885	588,000	156,200
In 1868	1,764,046	310,000	556,900
In 1867	2,765,531	850,000	230,780
In 1866	2,291,883	90,000	474,600

BELCHER.—During the month of March, 2,389 tons of ore were reduced, showing a yield of $53,945, equal to $22 57. The increased amount reported in our tabulated statement ($65,368) is due to the February yield, which could not be separated. The stopes yield about eighty tons per day, and drifting has been commenced on the ore-seam on the 730-level.

RICH STRIKE AT EUREKA.

The *Inland Empire* recently received a letter from Mr. Nixon, of Eureka, giving particulars of a remarkable rich strike in the My Mary Ann mine, owned by George W. Robbins, late of Treasure City. Mr. Nixon says that over a ton—to use his own words—of almost pure silver was thrown out at a single blast. We have been shown specimens of the ore, which is also well interspersed with free gold. The writer adds, that Buel's, Wilson's and other furnaces are being operated to the entire satisfaction of the proprietors, and that matters generally at Napias wear an encouraging aspect.

EXTENSIVE SALE OF MINES IN RAILROAD DISTRICT.

The Elko *Independent*, April 16th, has seen a deed conveying controlling interests in several valuable and well-known mines in Railroad district to E. L. Richie, of Philadelphia. "Mr. Richie has lately come to Nevada as the agent of a circle of wealthy gentlemen who are desirous of embarking in legitimate mining enterprises. The consideration for the mining property was $15,000. The agent has possession and is engaged in the development of the premises, and will increase his force of miners in the course of a few weeks, as soon as the weather will permit. The location of the district is such that the ore can be readily and economically transported to reduction works, until such time as the company can procure their own means of reduction. The ore yields readily to simple treatment, and the veins are heavy and present every evidence of permanency. Mr. Richie is fortunate in having been enabled to obtain the interests that he has, and we predict that a profitable season's work will crown his efforts."

ENGLISH CAPITAL IN WHITE PINE.

According to the White Pine *News*, April 20th, Eberhardt and Aurora Mining Company is the title of the English company formed in London for the purpose of purchasing the mines named in the title. The capital stock in £300,000 in £10 shares, all of which has been subscribed. The price to be paid for the Eberhardt and Aurora South mines is £300,000 (or about $1,455,000), one half in cash and the balance in shares—the latter to be retained until profits to the extent of £125,000 have been made and are divisible. The property has been thoroughly examined by the company's engineer, Melville Atwood, and by Thomas Philpots, acting agent for and himself a member of the company, both of whom left here on Monday for San Francisco, where their reports will be prepared and forwarded to London by Mr. Philpots. If these reports prove satisfactory to the subscribers (and we have every reason to believe they will), the capital will be immediately called up and the sale consummated.

MINING MATTERS IN HUMBOLDT.

We are glad to see by the *Silver State*, of April 19, that work is being resumed in the various mining districts of Humboldt county. In Buena Vista district the Seminole, Manitowoc, and several mines belonging to the Inskip company are being worked. In the Indian district parties are to work on the West Eagle mine, which was located late last fall. In Star district J. C. Fall has taken hold of the once famous Sheba mine. He is putting it in order, and intends to erect concentrating works. In Dun Glen district work is about being resumed on the Monroe series mine, owned by a New York corporation, and a shaft is being sunk on the Alaska mine. Confidence in the mines of Humboldt is reviving, and we hope that the experience acquired by past effort and deception will insure the success of the new operations.

The following items are from the Humboldt *Register* (Winnemucca) of April 23: "Extravagant reports of the richness of quartz mines recently discovered about fifty miles north of the Humboldt, in ranges south of Independence valley, are being circulated by parties who profess to be posted. Good placer diggings are also said to have been discovered in the gulches and streams in the vicinity. It is reported that two hundred pounds of ore taken from one of the leads netted the owner $200, at the English mill, where he had it worked. On the strength of these reports, which we are unable to trace to a reliable source, several prospectors are fitting up for an expedition to the new El Dorado. There is a vast area of territory comparatively unknown and unexplored north of the Humboldt, in which undoubtedly valuable mines abound, and the present season will demonstrate it to the satisfaction of all, as it is certain to be tolerably well prospected. At a meeting of the owners of the Butte mine, held in Galena on last Tuesday, it was decided to build a mill on the property for the purpose of reducing the low grade ores, which they find upon trial cannot be shipped to San Francisco with much profit to the owners. The company have derived sufficient funds from the proceeds of first-class ores shipped to build a mill, and no assessment for that purpose will be levied. The Superintendent and stockholders of the Stars and Stripes, thoroughly satisfied with the appearance and prospects of the mine, and the richness of the ore, a goodly number of tons of which have been reduced at the English company's mill, have concluded to build a mill at this point for reducing their ores. The site will be selected and work commenced immediately."

California.

THE FIRE IN THE AMADOR MINE.

A dispatch of the 14th ult., from the superintendent, reads as follows: "Sent men down the middle shaft last night. No fire in any part of the shaft at the 844-level. They crossed the north shaft, and explored the stopes north, and found one log on fire; also that the platform timbers had been carried away by the falling of the *debris*. Went down to the San Francisco level; found no fire. The water is twenty feet above the Panama level. Covered the shafts tight, and shall send down hose to-day to drive all the fire upward—covering the shaft as we come up. No caves have occurred thus far, and I think the damage is much lighter than at first supposed. No smoke this morning; a little steam and gas is escaping." The bullion yield for March aggregated $56,127. The stock had declined as low as $265 in the San Francisco market on the 14th ult., closing at $300. Another dispatch from Sutter Creek, April 13th, says on the morning of the 11th inst., smoke was discovered at the 844-foot level, north shaft, in the Amador mine, by lumbermen who were descending the shaft, but failed to extinguish it. Water was carried from the surface. Word for the men to come up was sent down. The shaft was clear at 10 A. M., the smoke coming out very strong from the north shaft. All the shafts were then covered air-tight, with twenty-five inches of water going down the north shaft. The building was torn down to prevent a general conflagration, and the smoke decreased gradually until 6 P. M. At 8 P. M., carbonic air gas coming from the north and middle shafts, confined it as much as possible. All night they tried to smother the fire. They now think the fire out, and are exploring the shaft.

SILVER MOUNTAIN BULLION.

According to the Alpine county *Chronicle*, April 7, the Stetefeldt furnace at Reno running on a few tons of ore from the Exchequer-Buckeye mine at Silver Mountain, produced results that were exceedingly gratifying to the Messrs. Chalmers, managers of the Exchequer and Imperial mines, who were present when the ore was worked. We are not at liberty, says the *Chronicle*, to state the amount per ton the ore worked, but we may say the result satisfies us that Silver Mountain can boast of one of the richest silver mines on the Pacific slope. The "brick," which the proprietors of the furnace say is the finest they have obtained during a twelve months' run on Nevada ore, being 901 fine, was forwarded from Reno to the home office in London, where its reception, so soon after starting work in the mine, will redound to the benefit of the Silver Mountain District. We congratulate our citizens on this gratifying result, as it is the opening wedge for the introduction of a large amount of foreign capital for investment in the mines of Silver Mountain.

QUICKSILVER MONOPOLY.

This significant news item is telegraphed from San Francisco to the Sacramento *Union*, under date of April 11: "The New Almaden, New Idria and Redington Quicksilver companies contracted with D. O. Mills for the entire product of their mines for two years from April 1st at $31 per flask. This makes the new combination more powerful than the old, and renders it certain that there will be no reduction in prices." This quicksilver will be sold, as we understand it, to any parties on the Pacific coast for the sum of $45 90 per flask, and to parties who wish to use it in any place not on the Pacific coast for $42 00 per flask. Quicksilver is indispensable in mining operations, and mining is one of California's resources. A monopoly has laid its heavy hand, through quicksilver, on this resource. Suppose that California now sends off for more immigrants, for more working men. More men of the kind are needed to make these monopolies do well. If the miners do not work, what will become of the quicksilver sales? These mines produce more mercury than the consumers of it need, and by the natural law of trade the article should be cheap, but by the combination it will remain high. Let us have more immigrants to help build large fortunes for the monopolies. The retail dealers in Grass Valley make just sixty cents per flask on their sales of quicksilver.—*Grass Valley Union.*

LATEST ACCOUNTS FROM THE SAN DIEGO MINES.

The San Diego correspondent of the San Francisco *Bulletin*, under date of April 11th, sends the following: "The 'Oriflamme' arrived a day earlier than was expected, bringing about fifty passengers and 100 tons of freight. No opposition steamer started yet, as has been predicted for a long time. It is currently reported that in another week one will be here. Judging from the crowded state of the present line of steamers, a good opposition boat could make it pay at lower rates than at present charged, for there would be a great access of travel. Twenty-five dollars for a two or three days' trip seems pretty high these times, and the luxury of a journey to San Francisco and back cannot be indulged in by the citizens of this county, except by a few flush ones. The reports from the mines continue favorable, but many people have left, finding there were no placer diggings which would pay. I hear that Chinamen are not allowed in the mines, the Democratic element being too strong. The local papers do not mention the fact, any more than they do many other mean things done under their very noses, lest they offend their speculating patrons; but many Chinese have gone on the steamers lately, which is pretty good proof that something is wrong.

The 'Cuyamac' grant is scaring a good many miners and others interested in the mines, as the owners or claimants say they have an order to 'locate' the claim, and that said claim will cover the 'Washington,' and some of the best, if not all, of the famous leads. There is always some claim in California to knock a poor fellow endwise when about to make a good thing. Any way, the 'rush' may be considered over for the present, though there seems to be no doubt of the richness of the leads. Capital must now step in and carry on the work which proprietors have initiated. Food and many other comforts are easy to be obtained in the mining district. Game is abundant in places; beef is fat and cheap, and good water gratis. The lumber trade in Newtown and National City is dull enough. Now that the new fence—or no fence—law has passed, the advocates of that doctrine will see what a beautiful thing it will be in a country like this when fully in operation. More than two hundred head of cattle and horses have been shot in and about 'Monument City,' and if there is such a thing as 'judgment' for unrighteous acts done in this brute world, the 'Tijucrna' settlers are paid for their shooting of stock. 'No crops,' is the universal cry everywhere near the line, and to a stranger, not conversant with the terrible mangling of stock, which has been winked at by every one of the settlers about the 'line,' it would look pitiable, the sight of their yellow grain. To me it had no such effect. I looked on their ruined prospects with a *sang froid* perfectly refreshing. The 'Arguello' family cannot stand the drought, and have removed their innocent stock to Tecarte, where there is plenty of grass, and in the end the heartless destroyer of their stock will come out second best. No rain these days, and no hope of any. Stock are nearly all taken to the mountains. Weather—hot in day-time, cool at night."

DISCOVERY OF NEW AND PROMISING MINES.

Private letters from San Diego county give particulars of some new discoveries in Julian and Cuyamac districts. A very rich and promising ledge, christened by its discoverers the "Stonewall Jackson," has been discovered within the last few weeks in the last named district. The discovering shaft has been sunk to a depth of thirty feet, developing a well-defined ledge, four feet in width, of very rich quartz. Free gold in abundance can be discovered on the entire surface, and specimens from any part of it, pounded up roughly, yield an excellent "prospect" on washing. Two hundred feet north of the discovery another shaft has been sunk, striking the lead at a depth of ten feet, and displaying a surface of very rich decomposed quartz. The boulders and dirt forming a stratum above it were covered with small particles of free gold to such an extent that it is supposed it would pay to sluice the stuff off for surface digging. The extension has been taken up, and prospectors are hard at work trying to find it. Julien district is progressing well. The "Washington" has been opened to a depth of thirty feet, and shows a vein of very rich stuff, about three and a half feet wide. The owners ask the most extravagant prices for a small interest, and are likely to continue to do so as long as their quartz looks so promising. In this, however, they are no exception to the majority of those who have taken up property of any kind, the prevailing opinion being that one has only to hold on to it to sell it at a high figure, and realize a fortune. The weather has, on the whole, been remarkably pleasant, with occasional showers.

Colorado.

IRON.

The Boulder *News* says: "Dr. Burdsal showed us to-day the finest specimen of iron ore we have seen in Colorado. It was very fine grained, melts easily, and runs over seventy per cent. The doctor has found a vein of the ore twenty feet thick, and has opened it to the depth of about five feet. He also brings in specimens of paving stone which occurs in slabs four by six feet and two inches thick. All this within twelve miles of Denver.

"COPPER.

"Mr. Dick Irwin has outfitted and dispatched a gang of miners to the San Luis park to operate a copper mine in that locality, and also a free gold gulch that he ran across during his explorations last year."

WATER IN THE BRIGGS MINE.

According to the Central City *Register*, on the 12th ult. the Briggs mine shut down, drowned out. We learn, says our cotemporary, that Mr. Beach offered to lease the pump of the Black Hawk company, on Gregory No. 1, and give ten thousand dollars bonds that the Black Hawk company should be subjected to no loss or liability on account of the pump. He also offered to advance five thousand dollars for the needed machinery for repairing the pump, to be considered as an advance on the two hundred dollars per week now paid by the Briggs company for pump benefits, and to be repaid in that way. Both offers were refused, against the wish of Mr. Congdon, by the officers of the Black Hawk company in New York. We give for what it is worth the rumor that the suspension here is caused by an active resumption of hostilities between the bond and stock-holders of the Black Hawk company in New York. LATER.—As we now understand the case, the payment received by the Black Hawk company has been two hundred dollars for only one week, and since that time only one hundred dollars per week. The five thousand dollar proposition was telegraphed east, but was refused by the company.

MINING WORKS IN CLEAR CREEK COUNTY.

The following is a complete list of the mills and reduction works in Clear Creek county, as published in the *Miner*: Franklin Silver Mining Company, amalgamating works, has a capacity of five tons per day; Whale Mill, amalgamating and smelting, Spanish Bar, ten tons; Fairmount, amalgamating works, Hukill gulch, five tons; McIntyre, amalgamating works, Mill creek, five tons; Swansea Smelting Works, Swansea, eight tons; Wilson & Cass Company, dressing works, Georgetown, twenty tons; Hupeden's amalgamating works, Georgetown, eight tons; Brown Silver Mining Company, smelting works, Brownville, four tons; Baker Silver Mining Company, Bakerville, twenty tons; International Silver Mining Company, amalgamating works, Argentine, five tons—making a total of one hundred and ten tons.

MENDOTA LODE.

We are pleased to announce, says the Georgetown *Miner*, that work will shortly be commenced on this lode. The Rockford Gold and Silver Mining Company, of Rockford, Illinois, organized by Mr. Seamen, of our city, have become the owners of the east half of the property. There is now a tunnel on the vein 130 feet in length, in the breast of which there is a vein of ore two feet in thickness, with an average of fifteen inches for the whole length of the adit, and assaying from sixty to eight hundred ounces to the ton of ore. The company will open the mine by a tunnel one hundred and fifty feet in length, which shall penetrate the lode at a depth of nearly one hundred and fifty feet. Then, with a drift of but one hundred and thirty feet in length, there will be ample stoping ground for a long time to come. A tramway will be built from the mouth of the tunnel to the Brownville road, near the Burleigh tunnel, for the expeditious transportation of ore. The Mendota is a gigantic vein, having a variable width of from eight to twelve feet, and is characterized by an abundance of mineral. The ore contains over forty per cent. of lead, and, as we have said before, contains from sixty to eight hundred ounces of silver per ton. The amount of ore that can be raised out of this mine, by judicious development, is, to say the least of it, enormous; and we rejoice to say that the Mendota is soon to be placed on the list of productive mines.

Missouri.

LEAD MINING.

The St. Louis *Journal of Commerce*, April 23, has the following mining intelligence: "Some new features are being inaugurated at the Cannon mines, in which the proprietors are manifesting commendable enterprise and liberality, worthy of emulation by all engaged in the same business. It has been customary with the owners of lead lands to exact from miners ten or fifteen per cent. of all mineral mined upon their lands, as a royalty. This company, located five miles west of Blackwell's Station, I. M. R. R., have decided to exact no percentage for mineral mined upon their lands, but to pay the full rates for mineral, regardless of where it is mined. They have about 2,000 acres which are thus open to miners, to work upon, free of all royalty. They also furnish nails, lumber, and materials for the erection of cabins, and charge no rent for the buildings, nor for the land which a steady miner may wish to cultivate. At present this company are driving four tunnels or levels; two of which are to reach the mineral lying below old diggings—expecting to reach mineral deposits a considerable distance below the bottom of the deepest pit. The other two are for proving new ground. Besides these, they have sunk a regular shaft about seventy feet deep, upon what has every appearance of being a true lode—a regular vein—with mineral from the surface.

"The Hazlewood lead mines, about twelve miles from Marshfield, in Webster county, are being worked by only a small force, and at a great disadvantage. The furnace is kept in blast about three days in each week, owing to a scarcity of miners. A Philadelphia company has purchased 6,300 acres of mineral lands in Carter county, and have employed miners and an accomplished mining engineer to commence work at once. They expect to find paying deposits of each—lead, copper, and zinc."

IRON.

"A number of geologists and iron manufacturers visited the iron banks near Rolla and Cuba, on the South Pacific railroad, this week and expressed themselves highly pleased with what they saw. Several banks are opened at Rolla sufficiently to show the formation and general character of the ore. At Iron Center Switch, (three miles west of Cuba,) the Meeker and Card mine is being worked; also Mr. Alexander's (?) north of the railroad. But owing to an advance in shipping rates by the railroad, which the iron men consider unreasonable and unjust, no iron ore is now being shipped from any point on the road. In other words, the iron men have struck for lower rates or for the old rates, which they deemed full high enough."

COAL.

"Last week we copied from the *Democrat* an article announcing the discovery of 'coal bed four feet thick, one mile north of Knobview.' Upon investigation, we find it to be the thin vein which was discovered during the last year of the war. The same vein was then only thirteen inches thick. If the statement in the *Democrat* is true, geologists will be gratified to learn of the rapid increase of the coal measure in this State, especially in a field within three miles of extensive iron banks! This is a good quality of bituminous coal, apparently free from sulphur, but unless thicker veins are found below it will hardly pay for mining it. Wm. James has employed some miners to investigate the locality thoroughly, and we shall soon be able to report more definitely."

Utah.

The White Pine *News*, of April 8th, gives the assay of the ore brought in by Milan Packard from the Tintic Mountains, in Utah. It shows the ore to contain thirty per cent. of copper and $597 94 the ton in silver. The absence of either metal would still leave the ore valuable, as there is an abundance of it, and the mines are not over sixty miles from the railroad. The ledges are large, well defined, crop out boldly and for long distances. Wood and water are plenty, and the cost of living is less than in the valleys of California. A large number of locations have already been made (mostly by Mormons), but they do not cover half the metal-bearing area. This discovery may be considered important, not alone intrinsically, but as another nail in the coffin of polygamy.

New Mexico.

We learn from the *Press and Telegraph*, March 2d: "The Chester quartz mill, commenced last November, started up its twenty-five 612-pound stamps on Wednesday for a trial. Everything worked well. It will run on custom work until a tramway to the company's lode is built. On the Great Eastern lode Messrs. Rowe & Young have a shaft down forty-five feet, well timbered. The vein is large and the quartz looks well. Crawford, Mitchell & Co. are running a tunnel to find the Gladstone silver vein, which they lost by a cave. Vernon & Co., on the Tecumseh lode, have good walls and a wide seam of quartz. Conley & Co. are developing the Atlantic. The shaft is down eighty feet. A number of tons of ore assorted for the mill are ready at the surface. The Floorman & Smith lode has also a quantity of quartz piled up."

Montana.

SALE OF MINING PROPERTY.

The Virginia City *Capital Times* of recent date, reports the sale of the 20-stamp quartz mill, with appurtenances, at the mouth of French gulch, near Summit, and the quartz property belonging to the Excelsior Montana Mining company, at sheriff's sale. Prof. Swallow run the property up to $25,000, but the hammer fell at the bid of Sam Ward for $30,000, as the acting attorney for parties in St. Louis.

Nova Scotia.

A PROMISING LEAD MINE.

A few months ago a lead mine was discovered in Pembroke, Upper Stewiacke, Province of Nova Scotia, of which the Toronto *Monetary Times* says: "Some three or four men have been at work most of the winter prospecting the ground and testing the quality of the ore. The vein which they have been working upon is from three to four feet wide. The ore which has been taken out and tested is of the richest possible quality, yielding ninety per cent. of sulphuret of lead. The 'lode' occupies the same formation as the celebrated Devonshire lead mines of England, which have been mined for something like one thousand years. The extent of area which has been partially prospected already is about one mile in length by half a mile in breadth, in every portion of which the same rich ore has been found, and ore of very good quality has been found some eight miles from the area which is now being worked. One good feature of this mine is that it occupies a very convenient locality, being only about ten miles from Riversdale station off the railway. It is also in the immediate vicinity of excellent water power, and in the midst of a thriving farming locality, which will be able to furnish the 'miners' with an abundance of the necessaries and many of the comforts of life.

Australia.

ANTIMONY, COPPER, AND DIAMOND MINING.

For some years past (says the *Age*) it has been known that a valuable ore of antimony was to be found at Anderson's creek and among the adjacent ranges, but it has never been found, apparently, in sufficient quantities to induce miners to direct their attention exclusively to the search for it. Some parties prospecting on the Mullam Mullam creek recently discovered such indications as to induce them to apply to the Mining Department for a prospecting license. Since that time there have been six applications for mining licenses sent in, while several leases have been taken up in the office of the local mining registrar and surveyor. The spot where the ore was discovered is situated near to the township of Templestowe, about a dozen miles from Melbourne. In face of the present falling off in the supply of the eastern mines, the present discovery (if it proves genuine) is an important and genuine one, since antimony is at present ruling higher in the English market than it has for many years past. As yet, however, it is a matter of uncertainty whether the new field will be a payable one or not.

Diamond mining as an industry, according to the *Mining Record*, is looking up. The Mudgee Gold and Diamond Mining company have obtained 170 stones in twenty days, with two of Hunt's three-quarter machines, which are capable of putting through twenty tons of washing stuff per day. A valuable discovery is said to have been made in the neighborhood of Benalla. A man named Edward Power, whilst out on the Fern-tree station, situated about twenty-two miles from Benalla, on a tributary of the Broken river, discovered some copper; he prosecuted his search, and found a lode six feet in width, with surface indications of copper for a distance of 200 yards. Two men are now engaged in prospecting, and Mr. Power has applied for a mineral lease for the land. Says the *Age*: "It is but right to say that copper specimens from the same locality were some time ago pronounced worthless by Mr. Brough Smyth, who ought to know."

SCHOOL OF MINES AT BALLARAT.

The Ballarat Mining Board have adopted the constitution for the above school, as prepared by Judge Rogers, and have appointed Mr. James Baker collector *pro tem.* The outline of constitution embraces, amongst others, the following provisions: Visitor—The Governor. President—To be elected for life by the council. Vice-President—To be elected for three years by the council. Council—To consist of twenty-seven members; the President, the Vice-President; four to be named by the Crown (life); seven, the chairman of each of the seven mining boards; fourteen to be elected for three years by the governors. Administrative Council—To consist of the President and Vice-President, and of seven members elected by the council. Governors—Life donation of £50; annual subscription, amount £3 3s. [Note.—Any corporate body may exercise the functions of a life-governor.] Master of the School—To be elected by the council, but liable to suspension or removal by the administrative council, subject to an appeal to the visitor. Professors—Chemistry, Geology, Mineralogy, Metallurgy—To be elected by the council. Pupils—All persons desirous of entering as pupils will (unless nominated by a governor) be required to submit their names to the administrative council, and, if eligible, will be entered on the roll as pupils on paying an entrance fee of £3 3s., and such annual or terminal fees as shall be fixed by statute, for instruction and lectures. All persons nominated by a governor will be entitled without the payment of any fee to be enrolled as pupils on presenting their nomination to the master of the school, but will have to pay the same annual or terminal fees for instruction and lectures as non-nominated pupils. All pupils must, on entry, sign the pupil-roll, and submit themselves to the discipline of the school.

FUNCTIONS.

Council—To frame all statutes for the government of the school, and to elect the President, Vice-President, administrative council, master of the school, professors, and examiners. To regulate by annual or other votes the appropriation of the revenues of the school. Administrative Council—To have entire executive control of the school, with power to suspend or dismiss master; dismissal to be subject to appeal to visitor; to superintend examinations; to have the control of the revenues of the school and their expenditure, subject to the annual or other votes of the council for their appropriation. With full proctorial authority over the pupils, including the power of expulsion, but expulsion to be subject to appeal to visitor; power to appoint and remove porter and other inferior officers. Governors—To elect members of council—life governors to have two votes, annual governors only one—and, subject to statutes, to present pupils for admission free of entrance fee; life-governors to nominate two pupils in a year, and annual governors one pupil only. Master of the School—To act as registrar until separate office is created; to attend at the school daily during such hours as shall be fixed by the administrative council (excepting days fixed as holidays by the statutes of the school), and to instruct in arithmetic, book-keeping, algebra, euclid, and so to apply these, algebra and euclid, as to instruct in mathematics and mechanics generally, so far as the better to fit pupils to attend the professors' lectures; mensuration, surveying, drawing, and so to apply these as to enable the pupils to read plans, to plot from field-books, and to take mining surveys both on surface and below ground. Engineering, as applied to mining in all its branches, not necessarily taught by the master, but may be by an assistant master or master on engineering. The Theory and Practice of Mining, to include periodical attendance with the pupils at the mine. [Note.—Another subject which would be taught in the school by a master would be chemistry as applied to metallurgy, so far as to prepare the pupils for the professors' lectures. This would probably require a separate master.] Professors—To deliver so many lectures, and on such subjects, as shall from time to time be provided by the statutes of the school. The first professorship to be established to be in chemistry, metallurgy, geology, mineralogy. Also to act under the statutes as examiners. Examinations—To be held so often, and on such subjects, as shall from time to time be fixed by the statutes of the school. Certificates—To be granted for efficiency in mining engineering, mining surveying, metallurgy, theoretical and practical mining. [Note.—Power should be given to the council to substitute for attendance on lectures at the school, attendance upon lectures in the university.]

BUSINESS AND PERSONAL.

[*Short notices in this column fifty cents per line each insertion.*]

GLYNN'S ANTI-INCRUSTATOR FOR STEAM BOILERS.—THE only and reliable article for removing and preventing incrustation. No foaming, and does not attack metals of boiler. Liberal terms to agents. C. D. FREDRICKS, 587 Broadway, N. Y.
April 19 tf.

MARKET REVIEW.

The Coal Trade.

NEW YORK, May 6, 1870.

WHOLESALE.—Very little of interest has transpired in coal circles during the past week. The supply is well up to the demand, and perhaps a little in excess. We hear of some inquiry for Lehigh coals, but mostly at prices below regular quotations. There is no change in the price of the various Company coals for May.

Our Anthracite table shows an increase in shipments up to Saturday last, the 30th ult., of some 200,000 tons, compared with our table for the same time in 1869. This amount added to that piled up at Honesdale (which could be speedily hastened to market should occasion require), the fair stocks here and at the East, all together, make affairs generally easy. Furnaces on the line are starting up pretty rapidly, to guard against any difficulties that may occur, and when once their wants have been provided for, no anxiety need be felt about a sufficient supply for city consumption, for all the combinations of miners in the Schuylkill region could not prevent the consumer from receiving his coal at fair figures. The miners in the Schuylkill district as yet show no signs of returning reason, and the trade here does not seem to care whether they keep on a strike to all eternity or not. The strike in the Lehigh region, noticed in these columns last week, has been adjusted.

The break in the Delaware Division and Lehigh Canal, which still prevents shipments to Philadelphia by canal, will, we understand, be repaired by Wednesday next. The line prices for Lehigh coal are unchanged.

The new schedule of canal tolls in this State (N. Y.), announced on Tuesday last by the Canal Board, makes a reduction on all kinds of coal of about 50 per cent.; and the charges this year will be half a mill per mile for each one thousand pounds, against about one mill for last year.

There has been considerable comment in coal circles relative to the imbroglio of the Philadelphia & Reading R. R. Co. and Messrs. Audenried & Co., the heaviest coal shippers in Philadelphia. It is looked upon by the trade generally as rather a shaky piece of business for the R. R. Company to be caught in. As we understand the matter, the difficulty is this: It seems that the Reading Railroad allowed Messrs. Audenried & Co. a special extra drawback for the entire season of 1869, which for a long time gave them a great advantage over other shippers. When Messrs. Audenreid & Co. demanded extra drawbacks at the end of the shipping season, amounting to some $100,000, the company repudiated any such agreement, and threatened that in case the same was insisted upon, they would deprive Messrs. A. & Co. of what shipping privileges they enjoyed at Port Richmond. Messrs. A. & Co. did insist upon being paid up, and hence the suit, which, we understand, has been decided against the company. It is very short-sighted policy for the Reading R. R. Company to allow large shippers so great an advantage over the smaller ones, and no doubt much trouble will arise from it. We understand that the R. R. Co. has appealed from the decision of the Court, and intend to carry the case up. Probably the same fate awaits the question of the payment of the drawbacks.

The Schenectady *Star* says: At a meeting of the officials of the Rensselaer & Saratoga and Schenectady & Susquehannah Railroad companies, and the Delaware & Hudson Canal Company, held in this city on Wednesday last, the arrangements for building the thirteen miles of railroad from this city to Duanesburgh, to connect with the Albany & Susquehannah road, and to make a great coal depot at Schenectady to supply the northern country, were concluded. A new bridge is to be built across the Mohawk below the city, to connect with the Saratoga road beyond its present junction with the Central.

Freights remain unchanged; vessels are not so plentiful, but the demand is light also. Our Philadelphia correspondent quotes the market as firm for orders on the line, and in home trade. There is some talk of the men going to work by the 15th inst. But very few credit anything of the kind. The commencement of operations would be the means of immediately breaking prices.

Anthracite Coal Trade for 1869 and 1870.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending April 30, 1870, compared with week ending May 1, 1869.

COMPANIES.	1869. WEEK.	1869. TOTAL.	1870. WEEK.	1870. TOTAL.
*Phila. & Reading R.R	86,612	1,137,027	27,002	842,053
Schuylkill Canal	24,973	140,490	1,415	21,209
Lehigh Valley R. R., N			6,370	99,055
" " " S	53,09:	884,941	79,020	1,044,970
L. Coal & Nav. Co. R R.	17,159	2 3,828	24,4 0	293,239
Lehigh Canal	29,554	123,936	5,803	29,942
Scranton North	1,155	17,678	13,226	203,780
" " South	32,949	503,680	40,000	558,982
Penn. Coal Co., rail	18,190	256,842	29,002	3?2,001
" " " canal	584	1,655	357	1,689
Del. & Hud. Canal Co.	54,224	188,727	56,4.1	168,658
" " R. R.	3,0?9	87,152	6,474	183,471
" " south	4,358	56,473	12,645	98,357
Shamokin	13,816	119,978	6,522	92,936
Trevorton	1,4??	7,054	2,321	77,925
Lykens Valley Coal Co.	1,255	15,658		
Wyoming South	8,700	12,060	7,121	7,691
" North			6,306	99,476
P. N. Y. C. & R. R. Co.				
Williamstown, Col'y	6,436	49,664	6,693	81,689
Short Mountain	2,021	23,781		
Total	344,854	4,028,511	332,615	4,242,431
1869	332,615			4,028,511
Increase week and year	32,230		Incr'se	242,920

* Less coal transported for Company's use and Bituminous coal.

Bituminous Coal Trade, 1869 and 1870.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending April 30, 1870, compared with week ending May 1, 1869.

COMPANIES.	1869. Week.	1869. Year.	1870. Week.	1870. Year.
B. & O. R. R.	18,964	240 555	8,426	209.566
C. & O. Canal	17,994	61.331	23.464	46,223
H. & B. T. R. R.	7,387	101,129	8,147	89,763
Harrisburg & D.			15,477	181,259
L. V. R. R.				5,?56
P. & N.Y. C. & R. Co.			5,130	66,558
	44,345	403,015	60,644	598,625

Schuylkill Coal Trade.

Report of Coal transported via the P. and R. R. for the week ending April 29, 1870—less coal carried for Company's use, and Bituminous Coal:

For week	27,062 17
Previously this year	814,990 11
Total	842,053 08
Same time last year	1,037,077 00
Decrease	195,023 12
Amount sent same week 1869	86,612 00

Report of coal transported on the Philadelphia and Reading Railroad for the week ending Thursday, April 28, 1870:

From St. Clair	155 07
" Port Carbon	1,372 18
" Pottsville	322 05
" Schuylkill Haven	14,633 14
" Auburn	1,007 02
" Port Clinton	4,117 07
" Allentown and Alburtis	4,854 04
" Harrisburgh and Dauphin	15,477 08
Total paying freight	42,540 05
Coal for Company's use	2 715 04
Total for week	45,255 09
To same time last year	1,028,023 11
Total	1,073,279 20
To same time last year	1,264,052 08

Report of coal transported over the Schuylkill Canal for the week ending Thursday, April 28, 1870.

	Tons. Cwt.
From Port Carbon	201 10
" Pottsville	217 00
" Schuylkill Haven	997 00
" Port Clinton	
Total for week	1,415 10
Previously this year	19,793 12
Total	21,209 02
To same time last year	140,490 05

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company, for week ending Saturday, April 30, 1870.

	WEEK.	SEASON.
North	52,068 18	730,087 15
South	12,644 12	98,557 15
Total	64,713 10	828,645 10
Corresponding time in 1869.		
North	44,057 01	623,032 14
South	4,358 02	33,752 18
Total	48.415 03	656,785 12
Increase North	8,011 17	Increase107,055 01
Increase South	8,286 10	Increase 64,804 17
Total Increase	16,298 07	Increase171,859 18

Report of Coal Transported by the Lehigh Coal and Nav. Co.'s Railroads and Canals,

Week ending April 30, 1870—Compared with same time last year.

WHERE SHIPPED FROM	WEEK, 1870. tons cwt	WEEK, 1869. tons cwt	YEAR, 1870. tons cwt.	YEAR, 1869. tons cwt.
Wyoming Region	29771 10	26579 17	304447 05	20?.?35 16
Upper Lehigh Region	2406 04	2877 04	29.81 01	5,3?6 13
Mahanoy Region		2?6 14		642 01
Hazleton Region	43 5 05	8434 05	15347 05	38 ?2 19
Beaver Meadow Region	1?43 15	4045 07	7645 1	18004 16
Mauch Chunk Region		1161? 00	30089 18	100 94 03
Totals	37526 12	47859 12	386614 05	418125 08
Increase				
Decrease	10324 00		31511 00	
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	24490 18	17159 18	293239 16	263428 08
Forwarded East of Mch Chunk by Canal	5963 07	29504 19	2?912 16	122926 15
Delivered at and above Mauch Chunk	579 15	521 15	12163 08	13102 07
Delivered to L. & B. R. R. at Plymouth Bridge	6492 12	664 00	51293 08	10167 15
L. V. R. R. at Sugar N.				5.00 00
Totals	37526 12	47859 12	386614 05	418125 08
Of the above there was from Mines controlled by Co., W.B.C. & L.Co	12277 10	11408 17	104?86 02	103546 02
L. C. & N. Co	963 08	1?19 09	30089 18	1003?4 03
Totals	13240 10	12548 06	134?35 05	203940 05
Increase				
Decrease	10307 16		69644 05	

Harrisburgh and Dauphin Coal Trade.

The following is the amount of Bituminous Coal transported via the P. and R. R. for the week ending April 24, 1870:

	Tons.
For week	15,477 08
Previously this year	165,781 09
Total	181,258 17

Report of Coal Transported over Lehigh Valley Railroad

For the week ending April 30, 1870, and previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	PREVL'Y. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Wyoming	15,609 07	227,132 17	242.741 04
" Hazleton	5,124 02	593,007 05	648,131 07
" Upper Lehigh	44? 04	4,?46 06	4,694 10
" Beaver Meadow	17,857 11	191,154 17	209,014 08
" Mahanoy	2,?24 19	83,419 09	96,144 08
" Mauch Chunk		447 17	447 17
Total Anthracite	91,764 03	1,109,407 11	1,201,171 14
Bituminous Coal recv'd from Cata. R.R.			
N. C. R R			
E. P. R. R		5,156 00	5,156 00
P. & N.Y. C. & R.R. Co			
Fall Creek			
Schroeder			
Towanda			
Total by rail and canal	91,764 03	1,114,563 11	1,206,327 14
Same time last year	73,306 10	907,?14 07	980,?45 17
Increase	18,457 13	207,641 04	225,?01 17
Decrease			
Forwarded East from M'h Chunk by rail	79,020 12	970,?50 05	1,049,970 17
Same time last year	5?,09.1 16	825,847 12	884,?41 08
Increase	19,?28 16	145,102 13	165,029 09
Decrease			

RECAPITULATION.

Forwarded East from M'h Chunk by rail	79,020 12	970,?50 05	1,049,970 17
To N. C. R. R., at Mount Carmel		115 00	115 00
Forwarded North from L. & B. Junction	6,370 00	92,6?6 07	93,053 07
To L. & S. R. R. at Packerton for rail	154 10	3,114 04	3,268 14
Delivered at M'h Chunk	11 10	516 16	?28 06
Delivered on line of road above Mauch Chunk	148 10	6 023 16	6,172 06
Delivered above M. Chunk for use of L. V. R.R.	849 13	23,289 18	21.159 11
To L. & S. R.R., at P'n Hav., for railroad			
Do. for canal	4,195 15,	8,344 12	12,540 07
At M.Chunk for canal	1,013 13	7,366 15	8 380 06
Total Anthracite	91,764 03	1,109,407 11	1,201,171 14
Bituminous Coal		5,156 00	5,156 00
Total all kinds	91,764 03	1,114,563 11	1,206,327 14

Penn. and N. Y. Canal and Railroad Co.

REPORT of Coal Transported via. the Pennsylvania and New York Canal and Railroad Company, for week ending April 30, 1870:

	WEEK.	PREVIOUSLY.	TOTAL.
Anthracite	6,306 13	93,169 12	99.476 05
Bituminous	5,130 00	61.5.8 00	66.658 00
Total, Ant. and Bit.	11,436 13	154,6?7 12	166,134 05

Cumberland Coal Trade.

B. & O. RAILROAD.

The shipments over the Baltimore & Ohio Railroad for the week ending April 30, 1870, were as follows:

From Georges Creek via Piedmont.	Tons.
Consolidation Co	3,191 15
Borden Co.	1,363 06
Midlothian Co.	346 11
Midland Co.	127 19
Cooke Co.	782 01
From Eckhart R. R.	
Spruce Hill Company	345 13
Consolidation	2,266 17
Total	8,425 02

Coal Trade by Canal.

For the week ending April 30, 1870, there were cleared at the port of Cumberland 211 boats laden with coal, shipped by the several companies, as follows:

American	3,966.05
Borden	3,6?7.08
Consolidation	3,691.15
do Eckhart Mines	1,419.11
George's Creek Coal and Iron Co.	677.08
Hampshire & Baltimore	1,347.19
Maryland	5 868.00
Midlothian	?06.05
James Boyce (from Eckhart)	1,239.11
R. G. Rieman & Co., do	?91.17
Mayfield & Hieston (from H. & B.)	219.15
Wm. B. Cost, "	113.02
F. Mertins, to Berlin, "	109.15
W. McKelvy, to Hancock (Md.)	110.12
Gas Coal	225.00
	23,464.03

The business for the month of April, foots up as follows:

American	16,420.12
Borden	7,466.03
Consolidation	12,?95.19
do. Eckhart Mines	3 597.0?
George's Creek	?93 06
Hampshire	5,8?8.11
Maryland	15,0?6.07
Midlothian	2,447.11
Individual Dealers	14,145.06
Total	76,200.19

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven $2 00
From Port Carbon, 8 cents per ton more.
Less drawback of 89 cents on all Coal shipped east of New : runswick and south of Cape Henry.

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Easton	$ 81
C. R. R., N. J., Easton to Elizabethport	1 12
Shipping expenses at Elizabethport	25
Warfage	10
Total	$2 28

MAUCH CHUNK TO PORT JOHNSON.

L. V. R. R., or L. & S. R. R. from M. C. to Easton	$ 81
C. R. R., of N. J., Easton to Pt. Johnson	1 19
Shipping expenses	25
Warfage	10
Total	$2 35

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Easton	$ 81
Morris & Essex R. R. Easton to Hoboken	1 19
Shipping expenses	25
Warfage	10
Total	$2 35

TO SOUTH AMBOY.

L. V. R. R.	81
L. & D. R. R.	1 09
Cam. & Am. R. R.	
Shipping Expenses	25
Total	$2 15

PENN HAVEN TO ELIZABETHPORT.

L. V. RR. Penn Haven to Easton	95
C. RR. of N. J. Easton to Elizabethport	1 19
Shipping expenses	25
Wharfage	10
Total	$2 49

BY CANAL.

Via Schuylkill Canal.

TO PHILADELPHIA.

From Schuylkill Haven	$1 07
" Port Carbon	1 10
" Port Clinton	1 00

TO NEW YORK.

From Schuylkill Haven	$1 70

Via Lehigh Canal.

TO PHILADELPHIA.

Lehigh Canal	$0 70
Freight and towage	1 07
Total	$1 77

TO NEW YORK.

Lehigh Canal	$ 40
Morris "	1 10
Freight	
Towing	
Total	$ 2,50

TO JERSEY CITY.

Lehigh Canal	$ 40
Morris "	
Freight	2 00
	2 40
For re-shipment	2 20
Total	$

Via Delaware and Raritan Canal.

TO NEW YORK.

Lehigh Canal	$ 40
Delaware Division Canal	30
Delaware and Raritan Canal	35
Freight	1,25
Towage	20
Total	$ 2,50

TO NEW BRUNSWICK.

Lehigh Canal	$ 40
Delaware Division Canal	30
Delaware and Raritan Canal	35
Freight	1,05
Total	$ 2,10

For Re-shipment—30 extra for shipping, and 10 cents. drawback.

Towing Rates.

TO EASTERN PORTS.

	Per Ton.
To New Haven	$ 40
Bridgeport	40
Southport	40
Westport	40
Norwalk	40
Stamford	40
	Per Boat.
Greenwich	$70 00
Port Chester	80 00
Mamaroneck	70 00
Glen Cove	55 00
New Rochelle	55 00
East Chester	60 00
West Chester	30 00
White Stone	30 00
College Point	25 00
West Farms	25 00
Flushing	30 00
Harlem and Mott Haven	20 00
Port Morris	20 00
Ninety-first street and Astoria	16 00

Boats beyond Port Chester, with less than 200 tons, $80 per Boat.

TO RIVER PORTS.

Boats of 150—250 Tons.	Per Ton.
To Manhattanville	8 cents
Spuyten Duyvil	8 "
Yonkers	9 "
Hastings	10 "
Piermont	12 "
Dobbs' Ferry	12 "
Nyack	14 "
Tarrytown	15 "
Sing Sing	16 "
Croton Landing	17 "
Haverstraw	17 "
Verplanck's	17 "
Peekskill	18 "
West Point	20 "
Cold Spring	20 "
Newburgh	18 "
Poughkeepsie	22 "
Rondout	23 "
Boats of 100 Tons	Per Boat.
To Manhattanville, and Return	$11 00
Spuyten Duyvil "	13 00
Yonkers "	15 00
Sing Sing "	20 00
Peekskill "	25 00

Freights.—MAY, 1870.

TO EASTERN PORTS.	From Philad'a.	From E. Port and Port Johnston.	From Newburg	From Rondout
Amesbury	$2 75	$ —	$	$
Bangor	2 75	2 00	1 75	
Bath	2 75	2 00	1 90	
Boston	2 00	1 85	1 80	2 00
Bridgeport	1 65	1 00	1 20	1 25
Bristol	2 00	1 40	1 45	
Cambridgeport	2 50	2 00	1 90	
Derby	2 00	— —		
Dighton	— —	— —	1 50	
East Cambridge	2 50	2 00	2 00	
Fall River	1 75	1 40	1 45	
Hackensack	1 95	1 50		
Hartford	2 75	1 50		
Jersey City	1 75	50		
Middletown	— —	1 25		
Mystic	2 00	1 40	1 35	
New Bedford	1 75	1 50		
Newburyport	2 00	2 00	1 90	
New Haven	1 70	1 00	1 20	1 25
New London	2 00	1 20	1 35	1 40
Newport	1 75	1 40	1 45	
New York	1 25	50	70	
Norwalk	1 75	1 00	1 15	
Norwich and tow	1 70	1 40	1 40	1 50
Pawtucket	1 90	1 40	1 65	
Portland	2 75	1 75		
Portsmouth, N. H	2 25	2 15	1 90	2 10
Providence	1 75	1 40	1 50	1 55
Rockport	2 10	— —		
Saco	2 50	2 10		
Sag Harbor	2 00	1 40	1 35	
Salem	2 25	2 00	1 80	2 00
Stamford	2 00	1 00	1 10	
Stonington	2 00	1 40	1 30	
Taunton	2 75	2 00		
Warren	— —	1 40	1 50	
Washington	1 10			
TO RIVER PORTS.				
Albany		1 00	- 60	
Catskill		— —	- 50	
Cocksackie		— —	- 50	
Coeyman's		— —	- 75	
Cold Spring		— —	- 35	
Fishkill		— —	- 30	
Haverstraw		50	- 60	
Hudson		— —	- 50	
New York		— —	- 70	
Nyack		50	- 60	
Poughkeepsie		— —	- 35	
Rhinebeck		— —	- 40	
Rondout		— —	- —	
Saugerties		— —	- 40	
Sing Sing		— —	- 75	
Stuyvesant		— —	- 55	
Tarrytown		80	- 75	
Troy		1 00	- 75	
West Point		— —	- 35	
Yonkers		40	- 60	

Foreign and Provincial Freights.

May, 1870.

Foreign.	
Newcastle and Ports on Tyne, per keel of 21 1-5 tons	£13 10@£14 10
Liverpool	12s.6d@14.ton
TO NEW YORK.	
Provincial	
Sidney	$ —
Lingan	—
Cow Bay	—
Port Caledonia	—
Little Glace Bay	—
TO BOSTON.	
Sydney	$ —
Lingan	—
Cow Bay	—
Port Caledonia	—
Little Glace Bay	—

Prices of Coal by the Cargo,

[CORRECTED WEEKLY.]

	AT NEW YORK, May 5.		AT PHILADELPHIA, May 5.	
SCHUYLKILL.	R. A.	W. A.	R. A.	W. A.
Lump	$— —	$5 00	4 50	— —
Steamer	— —	5 25	— —	— —
Broken	— —	— —	— —	4 50 to — —
Egg	5 75 to 6 25	5 50	— —	4 50 to — —
Stove	— — to — —	6 00	— —	4 50 to — —
Chestnut	4 50 to 5 00	5 00	—	4 00 to —
Pea	— —	— —	— —	— —
LEHIGH.				
Lump, (along side)	6 00	— —	— —	— —
Broken	6 00	— —	— —	— —
Egg	6 00	— —	— —	— —
Stove	6 25	— —	— —	— —
Chestnut	5 50	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Diamond Vein	R. A.	— —	— —	— —
New England	"	— —	— —	— —
Locust Dale	W. A.	— —	— —	— —
Honey Brook, Leh	W. A.	4 75 to 5 75	— —	— —
Spring Mountain	"	4 75 to 5 75	— —	— —
Sugar Creek	"	4 75 to 5 75	— —	— —
Sugar Loaf	"	4 75 to 5 75	— —	— —
Old Comp'y's	"	4 75 to 5 75	— —	— —
Cross Creek	"	4 75 to 5 75	— —	— —
Enterprise	"	"	— —	— —
Girardville	"	"	— —	— —
McMichael	"	"	— —	— —
Shamokin	"	"	5 50	4 50 — —
Lykens Valley	"	"	— —	— —
Broad Top	"	"	5 50	— —
Hill & Harris	"	"	— —	4 50 — —
Henry Clay	"	"	— —	4 50 — —
Powelton	"	"	5 50	4 50 — —

Prices for Coal at Mauch Chunk.

	F.L.	Bro.	Gra.	Eg.	Sto.	Cst.
Lehigh	$3 50	$3 50	$3 50	$3 50	$4 00	$3 25
Wilkesbarre	3 50	3 50	3 50	3 50	4 00	3 25

For freight to Elizabethport and to New York see "Freights."

BITUMINOUS COALS.

Kittaning Coal Co.'s Phœnix Vein..f.o.b. at Phila.	$5 00
Lemon " " "	4 75
Cumberland Vein Coal	5 00
Cumberland C. & I. Co.'s on board N. Y.	7 00
Maryland Coal Co. " "	7 00
Consolidated Coal Co.'s " "	7 00

[*Dealers in these coals may be found in our advertising columns.]

Company Coals.

	L.	Str.	Gra.	Eg.	Sto.	Ches.
Scranton at E. Port	4 50	4 60	4 75	5 00	5 75	4 60
Pittston at Newburgh	4 50	4 80	4 90	5 00	5 45	4 70
Lackawana at Rondout	4 50	4 85	4 90	5 10	5 75	4 70
Wilk'b're at Hoboken	4 75	4 75	4 25	5 25	5 75	4 75
Old Co. Lehigh at Pt. Johnston	— —	— —	— —	— —	— —	— —
Lehigh at E. Port	5 50	5 25	5 25	5 25	5 75	4 75

For freights to different points, see "Freights."

Prices of Foreign Coals.

May, 1870.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, New York.

Liverpool Gas Caking	$ 8 00@— —
" " Cannel	10 00@12 00
" House "	13 50@15 50
" Orrel "	12 00@14 00
Per ton 2,240 lbs., ex-ship.	
PRICES FROM YARD.	
Liverpool House Orrel, screened	$16 00@17 50
" " Cannel, "	18 00@20 00
Per ton 2,000 lbs. delivered.	

Prices of Gas Coals.

May, 1870.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr. 73 Pine st., N.Y.

Duty, $1 25, gold.	Coarse.	Slack.
Block House	$1 75	@- 75
Gowrie	1 75	@- 75

Corrected by Bird, Pickens & Job, 86 South street.

	Coarse	Culm of Coal.
Pictou	$2 25	@1 25
Sydney	2 25	@- 80
Lingan	1 75	@- 80
Little Glace Bay	1 75	@1 00
Caledonia	1 60	@- 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty $1 25 per ton, gold, on the coarse coal. 25 per cent. ad valorem on the Culm of Coal.

AMERICAN.

	Coarse.	Slack. Currency.
Fairmount Gas Coal Co. of N. Y.	7 50	@- —
Despard Coal Co.	$7 50	@- —
Penn.	- —	@- —
Newburg Orrel Gas	- —	@- —
West Fairmount Gas Coal	- —	@8 00

AT PHILADELPHIA.

Powelton $7 80

Prices at Baltimore—May, 1870.

Wholesale Prices to Trade.

Wilkesbarre, by car load or car load	$6 60@6 75
Pittston and Plymouth	6 00@6 50
Shamokin Red or White Ash	6 00@6 25
Lykens Valley Red Ash	- —@6 50
Zerba Valley	6 00@6 25
Trevorton, Red Ash	6 00@6 50
By retail, all kinds per ton of 2240 lbs.	7 25@8 50
Georges Creek & Cumberland f. o. b. at Locust Point for shipping	- —@5 00
West Fairmount Gas f. o. b.	6 60@6 50

Prices at Georget'n, D.C., & Alexandria, Va.

May, 1870.

George's Creek and Cumberland f. o. b. for shipping..$4 75

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$- —@- —
Lykens Valley	- —@- —
Shamokin Red or White Ash	- —@- —
Trevorton and Zerba Valley	- —@- —

METALS.

NEW YORK, May 6, 1870.

IRON.—Duty: Bars, 1 to 1½ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, 9 ₱ ton; Polished Sheet, 3 cents ₱ lb.

	Store Prices.
Pig, Scotch No. 1, ₱ ton	33 50@37 00
Pig, American, No. 1	33 00@34 —
Pig, American, No. 2	31 —@32 —
Pig, American, Forge	27 —@30 —
Bar, Refined, English and American	—@75 00
Bar, Swedes, assorted sizes (gold)	85 00@97 50
Bar, Swedes, ord'y sizes, less 5 ₱ ct.	115 —@125 —
Bar, Refined " "	77 50@— —
Bar, Common " "	72 50@— —
Scroll " "	87 50@115 —
Ovals and half-round " "	95 —@110 —
Band " "	95 —@— —
Horse Shoe " "	95 —@— —
Rods, ⅞ to 5-16 inch " "	85 —@120 —
Hoop " "	105 —@145 —
Nail rod, less 5 ₱ ct. " "	— 7 @— 7¼
Sheet, Russia, as to Nos. (gold)	— 11—@—12—
Sheet, Single, D. and T. Common	— 4¾@— 6½
Sheet, Galv'd, Nos. 14 to 26 List 15, 16 and 17 c. 25@30 ₱ c. off	
Rails, English (gold), ₱ ton	59 00 @60 00
Rails, American, at Works in Pa.	71 00 @72 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 2½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ₱ lb	— 15 @— 18
English Spring (2d and 1st quality)	— 7 @— 10
English Blister (2d and 1st quality)	— 10 @— 17
English Machinery	— 11½@— 14
English German (2d and 1st quality)	— 13 @— 15
American Blister "Black Diamond"	— — @— 12
American, Cast, Tool do.	— — @— 18
American, Spring, do.	— 9 @— 12
American Machinery, do.	— — @— 12
American German, do.	— 10 @— 12

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 20 cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 31
Copper Bolts	— @— 31
Copper Braziers, 16oz. and over	— @— 31
Copper Nails	36 @— —
Copper, Old Sheathing, &c., clean	17 @— 18
Copper, Chili Pig	— @— —
Copper, American Ingot	18¼@— 19¼
Yellow Metal, New Sheating	24 @— —
Yellow Metal Bolts	24 @— —
Yellow Metal Nails	— @— 24

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2¼ cents ₱ lb.

	Gold ₱ lb.
Galena, ₱ 100 lbs.	$— — @— —
Spanish (gold)	6 20 @6 25
German, do.	6 20 @6 37½
English, do.	6 20 @6 62½
Bar (net)	— @ 7 70
Pipe and Sheet (net)	— — @ 7 70

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.: Plate and Sheets and Terne Plates, 25 ₱ cent. ad val.

	Gold ₱ lb.
Banca	— @12
Straits	33⅞@34½
English	— @31½

PLATES.

	Fair to Good Brands.	Gold.	Currency.
I. C. Charcoal, ₱ box	$8 50	@8 75	$10 00 @10 50
I. C. Coke	7 —	@7 75	8 25 @ 9 25
Coke Terne	6 —	@6 25	7 25 @ 7 75
Charcoal Terne	7 75	@8 25	9 — @ 9 75

SPELTER.—Duty: In Pigs, Bars, and Plates, $1 50 ₱ 100 lb.

	Gold.
Plates, Foreign ₱ 100 lbs.	$6 00 @6 12½
Plates, Domestic ₱ lb.	10 @- 11½

REMARKS.

IRON.—The demand for Scotch Pig has partially subsided, but as the supply is only about equal to the trade requirements, prices are supported; we have only to notice a sale of 50 tons Glengarnock, from yard, at $35 50. American meets with very little inquiry, but prices are unchanged; we quote nominally $33@$34 for No. 1; $31@$32 for No. 2; and Forge, $29@30. There has been a little better demand for new rails, and the market is steady at our quotations; the sales are 1,000 tons 56-lb. English and 1,000 do. 56-lb. American, on private terms. Bar from store continues dull, but firm. The strike at the mills at and about Philadelphia has produced a firmer feeling in Bar. Swedes Bar is extremely scarce, and no assortment can be made up.

LEAD.—There is little more business in Pig, at unchanged prices; sales have been made of 50 tons common Spanish at $6 20; and 100 do. in lots from store, $6 25 gold. Bar, Pipe and Sheet are firm at $7 70 per 100 lbs. net cash, but the tendency is upward, with gold.

COPPER.—New Sheathing is steady at 31c., and Yellow Metal, 24c. cash. Ingot is in better demand, and the market has assumed a firmer tone, the tendency being in sellers' favor; sales have been made of 150,000 lbs. Lake Superior, for export, say 100,000 lbs. Central, and 50,000 lbs. Copper Falls, at 15½c. gold; 100,000 lbs. Baltimore at 18½c.; 50,000 lbs. Tennessee, 19c.; and 100,000 do. Detroit and Lake, 19½c.@19¾c. cash.

TIN.—There has been a considerable movement in Pig, at full, and in some instances rather higher prices, and the market still has an upward tendency. The sales are 1,400 slabs of Straits, to arrive at Boston, at 33¾c.@33½c.; 150 do. Billiton, here, 34c@34½c.; 15 tons English, 33½c.@34c.; and 50 do. Banca, on private terms. Banca is very scarce, held at 42c., and Straits and English 34½c., all gold. Plates have been quiet, but the advanced rates are well sustained; sales have been made of 250 boxes ½d. X Charcoal Tin at $8 75; 250 do. Charcoal Terne, $8; and 175 do., 20x28, $16 50 @$17, all gold.

SPELTER—Is a little higher in Europe, and, though the demand is still light, stocks are held firmly. Sales have been made of 45 tons, in lots, at $5 87½ for V. M., and $6 12½@$6 18¾ for Silesian, gold.

ZINC.—American Ox. Zinc, 6½ @ 7c.; French do. 9½ @ 10c.; Metallic, 9 @ 10c.

MANGANESE.—Lump, 4½c.; Powdered, 4¾c.

Mining Stocks.

NEW YORK, May 5, 1870.

The quotations of Mining Stocks exhibit considerable depreciation, compared with our last report, with but one or two exception. Sales of Smith & Parmelee were effected this A. M. at 1:40: Grass Valley, 22; Gregory sold at the Second Board for $1 55. Reference to our quotations elsewhere will give the present condition of the market.

Petroleum is firmer, and prices have advanced almost without exception. At the Second Board Central, sold at 65@64; United Petroleum Farms sold for 25. Home is still advancing, being quoted at from $4 75 to $5 25. Below is the latest report of the Stock Board:

	Bid.	Asked.
Bennehoff	31	34
Bergen Coal and Oil	40	—
Bliven Oil	35	1 00
Brevoort	1 00	1 20
Buchanan Farm	43	45
Central	60	70
Home Petroleum	4 75	5 25
N. Y. & Alleghany	1 75	—
Northern Light	65	1 00
Pithole Creek	1 30	—
Rathbone	31	—
Rynd Farm	30	35
Second National	—	75
Blood Farm	90	1 05
United Petroleum Farms	24	23
United States	75	—

San Francisco Stock Market.

We have no report from the Associated Press, nor through the official authorities, since our last, of the transactions of the San Francisco Stock Market, which, in view of the recent unusual activity in the mining sections, seems a little singular. A telegram, dated San Francisco, May 4th, reports Gould & Curry at from $1 55 to $1 67, which is a slight advance on our last quotations.

SAN FRANCISCO, May 4, 1870.

	1st Board.	2d Board.
Savage	55	55½
Crown Point	—	—
Yellow Jacket	49¼	50½
Kentucky	86	85
Chollar Potosi	—	30
Gould & Curry	1 55	1 67
Ophir	—	—
Alpha	—	—
Belcher	25	24½
Imperial	48	—
Hale & Norcross	—	—
Amador	—	—

A Large Establishment.

THE London *Engineer* gives interesting particulars concerning the new iron works erecting for Messrs. THOMAS ABBOT & Co., at Dunston, near Gateshead, which are now approaching completion. There have been twenty-two furnaces erected, and when all are working, three hundred tons of finished iron per week will be turned out. The fly-wheel of the engine, which has been cast by Mr. William Horsley, of Whitehill Point, weighs thirty tons, and it is an excellent casting. A large steam hammer has been supplied by Messrs. THWAITES, CARBUTT & Co., of Bradford, and the anvil-block, weighing thirty tons, has been constructed at the old iron works of Messrs. ABBOT & Co., Gateshead. The rolls have been supplied from West Bromwich, and the whole of the wheels by the Lilleshall Company, Shropshire. The works have been well carried out by Mr. GEORGE STONE, and are replete with the most modern improvements. About two hundred workmen will be employed.

THE boring-rod is one of the most potential tools of foreign scientific engineers. Our coal miners as yet know nothing at all about it. Artesian wells a few years ago did not exceed a foot in diameter. At Passy, a suburb of Paris, an artesian well three feet six inches in diameter was sunk not long ago, and completed with a diameter of two feet four inches. But, according to the Exposition Report of Mr. D'ALIGNEY, shafts of ten, twelve and fourteen feet in diameter are now bored with the same facility; and they have all the advantage which complete command of water can give over the slow, laborious, costly, and dangerous man-sunk shafts in common use. They pass through the wettest deposits down to drier ones, and reach, as in North-east France, salt beds and coal beds three thousand feet in depth. Why should we continue to sink shafts in the old-fashioned way, when they can be sunk with rods and borers like oil-wells? We saw, says Mr. D'ALIGNEY, triangular frames of iron, weighing several tons, and set with colossal steel teeth, which had been used by KIND for boring a shaft fourteen feet in diameter a thousand feet deep through hard rock strata!

MINING COMPANIES AND STOCK QUOTATIONS.

GOLD AND SILVER COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
Alameda Silver		A. Queran, 108 Wall st.	$2,000,000	$10 00		
Ada Elmore	South Boise, Idaho					
American Flag	Nevada District, Col.	P. P. Fullerton, 71 B'way	600,000	10 00		
Atlantic and Pacific	Humboldt Co., Nevada.					
Bates and Baxter	Colorado			50 00		
Benton	Colorado	W. F. Drake, 15 Broad	500,000	5 00		
Briggs	Colorado	J. P. Davies, 19 Cliff	1,000,000	100 00		
Black Hawk	Colorado	C.T. Whittington, 48 Broad	2,500,000	100 00	27	30
Bobtail	Colorado	J. Stanton, Jr., 25 Nassau	1,000,000			
Bullion Consolid'ed Gold	Colorado					
Burroughs Gold	Colorado					
Central Gold					20	
Consolidated Gregory	Colorado				1 55	1 65
Combination Silver	Nevada			100 00		
Columbia Silver	Austin, Nevada	J. M. Brown, 155 B'way	5,000,000			
Commercial Silver		J. E. Smith, 26 Pine	3,000,000			
Corydon	Gilpin Co., Colorado	J. Samuels, 40 B'way	500,000			
Downieville	Colorado		2,500,000	25 00		
Eagle Gold	Gold Dirt Dist., Col.	J. P. Davies, 19 Cliff	300,000	1 00		
Empire Gold and Silver	BodieBluff, MonoCo. Cal	H. K. Gates, 70 B'way	1,000,000			
Edgehill		A. Fullerton, 71 B'way	10,000,000			
Esperanza Silver		Ezra Clark, Jr., 13 William	400,000			
Fisk Gold		H. Johnson, 195 Fulton	500,000			
Forest Queen		E. B. Beet, 62 B'way	1,000,000			
Golconda Gold	Sherbrooke, C. E.	H. Adams, 71 Broadway	2,000,000			
Gunnell Gold	Colorado	J. H. Rolston, 80 B'way	1,000,000	50 00		
Gunnell Central	Colorado	C. B. Bostwick, 16 B'way	3,000,000	10 00		
Gold Rock		R. M. Lockwood, 93 Wall	400,000			
Grass Valley					2	
International Silver		J. W. Brazier, 26 Pine	600,000			
Hope Gold	Colorado		5,000,000			
Holman			2,000,000	25 00		
Kipp & Buell	Colorado		300,000			
Knickerbocker Gold		J. H. Rolston, 80 B'way	200,000	100 00		
La Crosse Gold	Nevada Dist., Col.	P. P. Fullerton, 71 B'way	1,000,000		8	12
Lander Hill T. & S.	Nevada	M.L.Catherwood, 74 B'way	1,000,000			
Lewis Gold	Georgia		1,000,000			
Liberty Gold					01	02
Manhattan Silver	Nevada	M. L. Ogden	400,000			
Maraposa common	California	Jas. H. Ferdon, 34 Wall	12,000,000		7½	8½
Mariposa preferred	California	do. do.			16⅞	17
Montana Gold		G. De Cordova	400,000			
Montana M. L. & M. Co.	Montana	A. M. Hoyt, 22 William	250,000			
Montrose	Clear Creek Co., Cal.	W. W. Perkins, 71 B'way	1,000,000			
New York Silver	Nevada	Thos. Sproull, 78 B'way	1,500,000			
New York and Austin	Nevada	E. R. Siccomb, 70 Wall	500,000			
New York and Owyhee	Owyhee Co., Idaho		1,000,000			
New York and Eldorado		G. H. Munroe, 10 Wall	2,000,000			
N. Y. & Montana M. & D.	Montana	F. A. Chapman, 20 Nassau	1,250,000			
N. Y. & Silver Peach	Nevada	R. C. Root, 74 B'way	2,000,000			
N. Y. & Utah P. & M.		W. H. Mailler, 108 Wall				
Nye						
Ophir Gold	Comstock Lode, Nev.	L. C. Warner, 70 B'way	625,000			21
Owyhee Gold		W. H. Smith, 43 Ex. Place	1,700,000			
Pahramagat Central	Nevada	J. E. Smith, 25 Pine	6,000,000			
Quartz Hill Gold		F. Bernard	2,500,000		25	35
Reese River Consol'd	Nevada	W. B. Ogden	6,000,000			
Rocky Mountain	Colorado	S. M. Pond, 70 B'way	500,000	10 00		5
Rollins Gold		Thos. Bond, 132 B'way	600,000			
Sensenderfer	Colorado	H. A. Shewill, 19 Broad	1,000,000		1 00	
Silver Bend		F. W. Macy, 20 Nassau	1,500,000			
Silver Mt. Silver		H. A. Moen, 71 B'way	1,000,000			
Silver Peak & R. M.	Nevada	W. B. Ogden, 52 Wall	5,000,000			
Smith & Parmelee	Colorado	W. H. Hollister, 6 Broad	2,500,000	20 00	1 40	1 45
Social & Steptoe Con.		T. H. O'Connor, 24 Nassau	450,000			
Standard Gold		C. B. Bostwick, 169 B'way	500,000			
Symonds Forks						75
Twin River Silver	Nevada	J. F. R. Hadden, 20 Nassau	800,000	100 00		
Texas Gold	Colorado		500,000	10 00		
Union Gold	Colorado	F. A. Potts, 110 B'way	1,200,000			
Wash. Mill & Silver	Nevada	W. W. Perkins, 71 B'way	300,000			
Wauba Yuma	Arizona	J. W. Silsby, 36 Pine	6,000,000			

COAL AND IRON COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Coal Co.		M. A. Myers, 119 B'way	$1,500,000	$25 00		
Ashburton Coal Co.		J. T. Rollins, 41 Pine	2,500,000			
Block House Coal		D. B. Keeler, Jr., 43 Pine	1,000,000			
Brewster Iron		H. Robison, 165 B'way	150,000			
Broad Top Coal & Iron Co	Pennsylvania	B. Love	2,000,000			
Cameron Coal Co.		J. A. Simpson, 40 B'way	2,500,000			
Carbon Hill Coal Co.		J. Silsby, 36 Pine	1,000,000			
Central Coal		F. P. White, 111 B'way	2,000,000	100 00		
Clifton Iron Co.		P. H. Riordan, 34 Pine	1,250,000			
Columbia Iron		E. D. Webb, 77 Cedar	1,000,000			
Consolidation Coal	Maryland	J. S. Mackie, 71 B'way	5,000,000			
Crawford Coal		E. Clapp, Prest, 137 B'way	1,000,000			
Cumberland C. & I. Co.		E. Kisean, 90 B'way	5,000,000			31½
Derby Coal Co.		W. S. Davison, 11 Broad				
Dover Coal and Iron Co.		L. Chase, 88 Wall			6	
Del. & Hudson Canal Co.		R. H Nerderpol, 7 Nassau	15,000,000	100 00	100	
Ebervale Coal		G.L.Stout, Treas.,111 B'y	500,000			
Fall River Bituminous		D. T. Blauvelt, 45 Pine	1,000,000			
Farrar Coal		C. H. Jones, 43 Pine	250,000			
Fisher Iron Co.		M. Ellis, 19 William	100,000			
Hamp're & Balt. Coal		S. M. Pond, 70 B'way	500,000			
Iron Cliffs Co.		C. J. Canda, 52 Wall	1,000,000			
Jackson Iron		G. P. Loyd, 119 B'way	300,000			
Kemble Coal & I. Co.		R. A. Wight, 26 Ex. Place	300,000			
Keokuk Coal		J. F. Franklin, 112 B'way	100,000			
Lackawanna I. & C.	Pennsylvania	E. C. Lynde, 52 Wall	1,200,000			
Lewis Run C. & I. Co		C. A. Sanborn, 80 B'way	750,000			
Lykens Val. Coal Co.		F. A. Platt, 13 William	800,000			
McKean Co. Bit. Coal Co.		J. H. Rolston, 80 B'way	1,500,000			
Lehigh & Susquehanna		E. W. Cark, Philadelphia, Pa.			1 00	
Mahanoy			400,000	100 00		
McNeal C. & I. Co.		C. C. Godwin, 71 B'way	500,000			
Mount Riga Iron		G. M. Newton, 42 Cedar	300,000			
New Boston Coal		C. H. Ogden, 55 B'way	2,000,000			
N. Y. Con. C. & I. Co.		A. T. Levine, 16 Wall				
N. Y. & Lehigh Coal		T. Simpson, 111 B'way	150,000			
Pacific Coal Co.		G. Wrighton, 34 Wall				
Peekskill Iron Co.		W. Murdock, 7 Nassau				
Pennsylvania Coal Co.		E. H. Mead, 111 B'way	3,200,000	50 00		
Richmond Iron Co.		[illegible] Smith, 165 B'way	1,000,000			
Scotia Coal Co.		[illegible] S. Soper, 42 B'way	2,500,000			
Spring Mt. Coal		[illegible] Runyon, 111 B'way	1,250,000			
Springfield & D'p Run C.		[illegible] D. Webb, 77 Cedar	600,000			
Stout Coal Co.		[illegible] S. Comstock, 111 B'way	500,000			
Susquehanna & Wyoming		E. Potter, 40 B'way	1,000,000			
Tannerdale Coal		I. T. Ludlaw, 71 B'way	250,000			
Wash. Mutual Coal		M. C. Baker, 117 B'way	420,000			
West Point Iron Co.		R. C. Brock, 110 B'way	500,000			
Wilkesbarre C. & I. Co.		W. H. Tillinghast, 80 Br'y	3,400,000			
Wyoming Val. Coal Co.		E. Potter, 40 B'way	1,000,000			

COPPER AND LEAD COMPANIES.	SITUATION OF MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED
Anita Copper	California	J. A. Ferguson, 8 Wall				
Corinth Copper	Corinth, Vermont	S. H. Howard, 191 B'way	$500,000	25 00		
Davidson Copper						
Eagle Harbor Copper	Michigan	W. H. Smith, 43 Ex. Place	500,000	25 00		
Evergreen Bluff Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000	25 00		
Globe Copper		R. K. Rickard, 19 Nassau	200,000			
Grand Portage Copper Co		A. S. Kellogg, 22 Pine	500,000			
Guymard Lead		Samuel Vernor, 38 Pine				
Hilton Copper		W. H. Smith, 43 Ex. Place	500,000			
Hope Copper		J. W. Davis, 19 Nassau	500,000			
Hudson River Copper	New York	T. Clarkson, 22 William	1,500,000			
Indiana Copper Co.		J. M. Mills, 25 Nassau	500,000			
Isle Royale Copper	Michigan	F. W. Caper, 44 Ex. Place	1,000,000			
Keweenaw Copper	Michigan	F. W. Caper, 44 Ex. Place	500,000			
Lake Superi'r Silver Lead	Michigan	A. S. Kellogg, 22 Pine	1,000,000			
Omiga Copper	Michigan	S. Cooper, 7 Pine	500,000			
Ridge Copper	Michigan	J. L. Gardiner, Jr., 43 Ex P	500,000			
Rockland Copper	Michigan	A. Fullerton, 71 B'way	500,000			
St. Joseph Lead	Michigan	J. W. Jones, 6 Broad st,	1,000,000			
St. Marguret Copper		E. P. Sutton, 43 Pine	250,000			
Schoolcraft Copper		R. Walsh, 22 William	500,000			
Superior Copper	Michigan	A. Fullerton, 71 B'way	500,000			
Union Copper		A. S. Kellogg, 22 Pine	500,000			
Vermont Copper	Vermont	J. C. Ely, 191 B'way	500,000			
Wallkill Lead, asst		S. M. Pond, 70 B'way			05	10

MISCELLANEOUS.	SITUATION MINE.	SECRETARY AND PLACE OF BUSINESS.	CAPITAL.	PAR VALUE.	OFF'R'D.	ASKED.
American Zinc Co.		W. E. Lawton, 19 Cliff	$1,000,000			
Bigelow Blue Stone Co.		H. Bogardus, 14 Pine				
Quicksilver					9½	9¾
Covill B. L. M. & M'f. Co		C. B. Bostwick, 302 Pearl	250,000			
Manhattan Marble		H. K. Gates, 70 B'way	300,000			
N. Jersey Zinc Co.	New Jersey	A. H. Farlin, 61 Maiden L'e.	1,500,000			

The Proposed Reform in the Mint Laws of the United States

THE following letter and report upon this subject have been furnished us for publication :

TREASURY DEPARTMENT, April, 25, 1870.

SIR : I have the honor to transmit herewith "A Bill revising the Laws relative to the Mint, Assay Offices, and Coinage of the United States," and accompanying Report. The bill has been prepared under the supervision of JOHN JAY KNOX, Deputy Comptroller of the Currency, and its passage is recommended in the form presented. It includes in a condensed form all the important legislation upon the coinage not now obsolete since the first Mint was established in 1792, and the Report gives a concise statement of the various amendments proposed to existing laws and the necessity for the changes recommended. There has been no revision of the laws pertaining to the Mint or Coinage since 1837, and it is believed that the passage of the enclosed bill will conduce greatly to the efficiency and economy of this important branch of the Government service.

I am, very respectfully, your obedient servant,

GEORGE S. BOUTWELL, Secretary of the Treasury.

HON. JOHN SHERMAN, Chairman Finance Committee, Senate of the United States.

REPORT OF THE HON. JOHN JAY KNOX, DEPUTY COMPTROLLER OF THE CURRENCY, UPON THE MINTS, ASSAY OFFICES, AND COINAGE OF THE UNITED STATES.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
WASHINGTON, D. C., April, 1870.

SIR : The last annual report of the Secretary of the Treasury contained the following paragraph : "The mining and coining of the precious metals is now so large a national interest that it deserves more attention than it has hitherto received. At present there is no Bureau or officer in the Treasury Department at Washington charged especially with the management of this great interest. I therefore recommend that provision be made for the appointment of a proper officer to be intrusted with this branch of the public business, under the direction of the Secretary of the Treasury.

"The coinage of the country is diminished in amount by the fact that in England and France the Mint expenses are much less than with us." It would, no doubt, have a tendency to prevent the export of the precious metals in the form of bullion, if the Mint charges were to be reduced or altogether abolished."

In accordance with your request, made some weeks since, to prepare a bill which should include these recommendations, and also present in a concise form every important provision contained in the different laws relative to the Mint and coinage, I have the honor to hand you herewith "A Bill revising the Laws relative to the Mint, Assay Offices, and Coinage of the United States." The method adopted in the preparation of the bill was, first to arrange in as concise a form as possible the laws now in existence upon these subjects, with such additional sections and suggestions as seemed valuable.

Having accomplished this, the bill, as thus prepared, was printed upon paper with wide margin, and in this form transmitted to the different Mints and Assay Offices, to the First Comptroller, the Treasurer, the Solicitor, the First Auditor, and to such other gentlemen as are known to be intelligent upon metallurgical and numismatical subjects, with the request that the printed bill should be returned with such notes and suggestions as experience and education should dictate. In this way the views of more than thirty gentlemen who are conversant with the manipulation of metals, the manufacture of coinage, the execution of the present laws relative thereto, the method of keeping accounts, and of making returns to the Department, have been obtained with but little expense to the Department, and little inconvenience to correspondents.

Having received these suggestions, the present bill has been framed, and is believed to comprise within the compass of eight or ten pages of the revised statutes, every important provision contained in more than sixty different enactments upon the Mint, Assay Offices, and the Coinage of the United States, which are the result of nearly eighty years of legislation upon these subjects.

The new features of the bill now submitted are, chiefly—the establishment of a Mint Bureau at the Treasury Department, which shall also have charge of the collection of statistics relative to the precious metals ; the consolidation of the office of Superintendent with that of the Treasurer, thus abolishing the latter office, and disconnecting the Mint entirely from the office of Assistant Treasurer ; the repeal of the coinage charge, and authorizing the exchange of unparted for refined bars ; a reduction in the amount of wastage, and the tolerance (deviation in weight and fineness) allowed in the manufacture of coin ; requiring the token coinage to be of one material of uniform value, and to be redeemed under proper regulations when issued in excess, and the expense of its manufacture to be paid from specific appropriations, and not from the gain arising in its manufacture, as heretofore ; an entire change in the manner of issuing the silver (subsidiary) coinage ; discontinuing the coinage of the silver dollar ; limiting the amount of silver to be used as alloy, so as to make the gold coinage of uniform color ; the destruction of the dies not in use annually ; requiring vouchers to pass between the different officers of the Mint in all transfers of bullion or coin ; requiring increased bonds from officers of the Mint, and authorizing each officer to nominate his subordinate before appointment ; and also making it an offence to increase or diminish the weights used in the Mint.

The Mint was located at Philadelphia by act of April 2, 1792, for the reason that, at that time, that city was the seat of Government, and the commercial centre of the country. The act of January 18, 1837, gave to the Director of the Mint the supervision of the Mint and branches. Two years previous—March 3, 1835—an act had been passed establishing branch mints at New Orleans, at Charlotteville, North Carolina, and Dahlonega, Georgia.

There was no expectation that any large amount of bullion would be deposited at these institutions, and they were established rather to gratify the desire for the establishment of Mints in the South than from any motive of sound national policy, and their supervision was placed under the control of the Mint at Philadelphia.

Eleven years later, January 19, 1848, gold was discovered in California ; and twenty-two years later, June, 1859, silver (the Comstock lode) in Nevada. In July, 1852, the Branch Mint in San Francisco, and, in March of the next year, the Assay Office in New York, were authorized ; and, following out former precedents, these institutions were placed under the control and regulation of the Director of the Mint. This supervision has been merely nominal. In the year 1856, large losses, nearly a quarter of a million of dollars ($235,073 12) occurred in the office of the melter and refiner in San Francisco, and a committee, and subsequently a special agent, was sent by the Secretary of the Treasury to examine that institution, who reported great irregularities in its management, and the amount of the deficiency, no portion of which was ever recovered. An examination was also made by direction of the Secretary, in the year 1866, which exhibited large differences in the accounts of the Coiner and the Treasurer, which could have easily been traced to the responsible party, if the different officers of the Mint had been required in their transfers of bullion, to take and receive the ordinary receipts required in business transactions.

During the present year the examinations which have been made by your direction into the affairs of the Branch Mint at San Francisco and Denver, and of the Assay Office in New York, have disclosed other irregularities, resulting in large losses to the Government, which might easily have been prevented by periodical examinations conducted by competent persons.

The examination into the affairs of the Assay Office in New York in particular, exhibited the fact that vouchers had been paid for many years by different Treasurers of that office without requiring the approval of the different officers for whom the supplies had been ordered, and that these vouchers had been transmitted to the Department, and passed upon by the accounting officers of the Treasury, it not being considered a part of their duty to examine vouchers transmitted to them from the Mints and Assay Offices to ascertain if the regulations of the Mint at Philadelphia had been followed. No official examination of the Assay Office in New York by the Director of the Mint, as far as can be ascertained, has ever taken place, and it was with difficulty that a copy of the regulations of the Mint for the transaction of business could be found.

A large portion of the business of the Mint at Philadelphia is the manufacture of the minor coinage. The total amount of copper, bronze, and copper-nickel coinage which has been issued at the Mint is $10,407,603 55. Prior to the year 1858, the total issue was $1,662,813 55 ; the balance, $8,744,790, has all been issued during the last twelve years.

The expense of the manufacture of this coinage has been paid from the gain arising from the conversion of copper, bronze, and copper-nickel into coin, having a nominal value much exceeding its intrinsic value. The amount paid into the Treasury during the past twelve years from this source has been $4,225,000, so that the minor coinage has been manufactured at a cost of more than one half of its nominal value. If the manufacture of this coinage had been under the supervision of an officer not influenced by the clamor for patronage, and independent of all local pressure, its cost would not probably have been more than one-third of its nominal value.

The National Banks of the country are subject to examination annually, or oftener, by experts ; and a corps of special agents are continually in the service, looking after the interests of the Government in connection with the Custom Houses, and the depositories of public money. The Mints and Assay Offices of the United States should at all times be subject to like inspection. The Mint at Philadelphia is one of the institutions requiring this supervision. Its coinage is only about one-sixth of its sister institution in San Francisco, and its deposits about one-third of the Assay Office in New York ; so that if the officers of each establishment are equally well qualified, the Mint in Philadelphia has no right to claim the supervision of establishments more favorably located for receiving deposits of bullion. Moreover, an officer located at the seat of Government, by the opportunity afforded him of interviews with different persons from all parts of the country, would be more likely to learn the wants and views of each section in its relation to the business of this office. Having the supervision of the statistics pertaining to the development of the mining industry of the precious metals, as provided for in the bills, and the opportunity of obtaining valuable information from other departments of the Government, he would be able, at all times, to furnish the most accurate data relative to the annual production, and the amount of precious metals existing in the country, and annually exhibit, in concise and well-arranged tables, statistics relative to the coinage of the country and of the world. He would require frequent reports in reference to all business transactions at the different establishments, and would carefully scrutinize all vouchers made to the department before they passed to the accounting officers for final settlement. Having made personal visitations to the different institutions, he would be able to criticise the estimates of each establishment (the annual estimates for the Mint service during the year 1870, as presented by the Director, were $826,526), and to reduce these estimates within proper limits before they are transmitted to Congress. He would hold the same relation to the institutions under his charge that the Treasurer of the United States holds towards the different Assistant Treasurers ; and the officers of Customs, and other heads of departments, toward their subordinates. Finally, by devoting his time to the consideration of these subjects, he will be able to present intelligent views upon "the mining and coinage of the precious metals, which is now so large a National interest as to demand more attention than it has heretofore received."*

The office of the Treasurer of the Mint in the proposed bill has been abolished, and his duties transferred to the Superintendent. The only objection to this change is that the office of the Superintendent should be kept distinct, so that he may be a check upon the Treasurer. This is unnecessary. In the proposed bill the assayer, who determines the value of bullion, is required to countersign the certificate issued to the depositor, who is himself present, and watchful for his own interest. A sufficient check upon the purchase of supplies will be to require, as at present, the approval of the officer for whose use such supplies are ordered, upon all vouchers before payment.

The business of the different Assistant Treasurers has of late years been very much increased. The office of the Treasurer of the Mint is in every instance in a building disconnected from that of the Assistant Treasurer, and the business is usually performed by subordinates. It is, however, impossible to examine in a satisfactory manner the office of an Assistant Treasurer, who holds at the same time the office of Treasurer of the Mint, without at first closing the Mint, precipitating the bullion in solution, and ordering a general settlement of the institution, a proceeding which requires many days, and which is not usually performed oftener than once a year.

The bill also increases the bonds of the operative officers of the Mint, and authorizes them to nominate their subordinates, subject to the approval of the Superintendent, before they are submitted for appointment. This provision will prevent an excess of workmen, make each officer responsible for the men employed, and prevent the forcing of incompetent and undesirable subordinates upon the different officers. Authority is also given for obtaining the services of skilled artisans in the preparation of dies for coinage.

It is not proposed in the present bill to increase or diminish the charges for refining bullion, but to encourage the refining of gold and silver bullion by private parties, and to authorize, under proper regulations, the exchange of unparted bars for refined bullion, thus reducing the expense and unavoidable wastage consequent upon that process. It is well understood upon the Pacific coast that private parties can refine bullion at a much less rate than the Mint. This is owing, in the first place, to the fact that private parties can use the sulphuric acid process, which is much cheaper than the nitric acid process of the Mint ; and secondly, that the deposits at the Mint in San Francisco are chiefly in gold, when it is absolutely necessary that there should be two parts of silver mixed with one part of gold in solution, in order successfully to part the one from the other. The Mint must therefore purchase silver to be used for this purpose, and use, at a loss, a much larger amount of acid than is necessary for the manipulation of the bullion deposited.

Private refiners have too much silver, the Mint too little ; an exchange can therefore take place beneficial to both parties, without the slightest risk to the Government, and with a contingent benefit to the miner and the depositor.

[TO BE CONTINUED.]

The Big Horn Exploring Expedition.

IT appears by the following dispatch and circular that the Washington authorities have reconsidered their orders forbidding the departure of this long-contemplated expedition to the Big Horn country. The Government, it seems, thought that the daring adventurers might, by penetrating into the Sioux lines, be instrumental in inciting new Indian atrocities. As it appears now, however, the authorities have probably only restricted the movements of the party, in such a way as to keep them off the Sioux reserves, and will not, it is thought, allow them to go to the region which its organizers had first in view. The following special dispatch to the Omaha *Daily Herald* speaks for itself :

"CHEYENNE, W. T., April 15.

"A telegram from Chief Justice Howe, who went to Washington in the interest of the Big Horn Mining Association, announces the fact that his mission has been successful, and that the expedition will be permitted to go, instructions having been sent General AUGUR to that effect. On receipt of this telegram the following circular was issued :

"OFFICE BIG HORN AND BLACK HILLS MINING AND EXPLORING EXPEDITION, CHEYENNE, W. T., April 14.

"The Big Horn Expedition will start from here the first week in May. Each man will require $75 to provide himself with four months' provisions, and transportation for the same. Railroad fare for parties of twenty-five and upwards is reduced to $37 per man from Chicago to this point. P. H. HALL, assistant General Superintendent of the Chicago, Rock Island and Pacific Railroad at Chicago, will issue tickets at the above price to all parties coming West to join this expedition. The rendezvous at Chicago is at the Union Pacific House, situated opposite the depot of the C. R. I. and P. R. R. The Winchester carbine is the arm recommended ; they cost $32 here. A twelve-pound howitzer has been provided for the expedition, with ammunition for the same. Parties wishing to be mounted can be provided here at about $100 for a good pony. Many will go on foot with the train, and thereby save the expense of a horse. A complete outfit can be purchased here very reasonably. Parties wishing to join should be here before May 1.

"By order of the Executive Committee.

"S. FARRON, Secretary. (Signed) N. MURRIN, President."

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* In the English bill hereto annexed, the Chancellor of the Exchequer of Great Britain is made the "Master of the Mint," with authority to appoint "Deputy Master," and other officers.

THE ENGINEERING AND MINING JOURNAL.

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ROSSITER W. RAYMOND, Ph. D., Editor,

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Gas in Congress.

THE members of Congress ventilate, every spring, their notions of ventilation; and as the subject is periodically referred to a committee, and the committees change as often as their members retire from Congress, there is a refreshing *naïveté* and elementary simplicity about the views presented by these amateur philosophers. But the comments of the members who do not even study the subject in committee are still more entertaining. The other day, an hour or two out of the infinite leisure of the House were devoted to this theme, and a number of gentlemen favored the country with their ideas. One of them said the chamber never can be ventilated, so long as it is an interior room, not communicating with the outer air; yet while he spoke, an immense volume of pure air from without was being pumped into the chamber, and he did not realize it, because he did not feel cold. What such people mean by ventilation is a sensible draught; they cannot understand how warm air can be pure; they want to be able to put their heads out of a window after a heated debate. It is quite true that sunshine would add to the pleasure of the members; but it does not follow that they are debarred from pure air. The galleries complain; but the people in the galleries come with cloaks, overcoats, and shawls, and the room cannot be cooled to accommodate them.

The principal trouble with the mechanical ventilation of the Capitol is in the persons appointed to manage it. Those whom Gen. MEIGS selected for that responsible work have long since been removed, to make way for political *protegés*, and the complete machinery is but incompletely served.

Another luminous remark came from a member who protested against being obliged to sit, night after night, beneath the blaze of a thousand gas-lights, which scorched his bald and otherwise unprotected head. The New York *Times* innocently echoes this complaint, and thinks something should be done. But all these gas-lights are outside of the chamber, and separated from it by glass windows. Their scorching blaze is therefore a mere figure of speech. It could not be felt by the most delicate and least hirsute of venerable noddles. Radiant heat from artificial sources will not pass through glass, and members must find some other excuse for their well-known disinclination to attend evening sessions. There is a good deal of heat, though perhaps little radiance, in the debates on the tariff, and many sturdy blows are dealt upon resounding pates. Possibly these are the sources of the caloric and the bad air which are unjustly charged upon the engines in the cellar, or the gas-flames in the garret.

Abandoned Mines.

WHEN we were students of mining in Germany, no part of the elaborate and detailed lectures to which we listened seemed to us less likely to come into play in American practice, than the discussion of the proper methods of investigating the value of ancient and abandoned mines. That sort of thing might be all very well, we thought, for Europe, where mining has been carried on for a thousand years, and many localities have been in former times forsaken on account of war, pestilence, famine or insurmountable difficulties of working, which now might be profitably re-occupied, under the protection of a settled civilization and with the powerful aid of modern machinery and science. But as for any such problems in the United States, beyond the archæological curiosity attending the ancient operations of the Indians at Lake Superior, and possibly some traces of the mining of forgotten tribes in Arizona and New Mexico, we could not conceive of their occurrence for generations to come.

A few swift years have changed all that; and the vast area of our public domain is sprinkled with abandoned mines and mining districts, the history of which is rapidly fading out. Already it has become a frequent duty of the consulting engineer to visit such regions, and attempt to form some opinion of the feasibility of renewing, under more favorable auspices, the enterprises which have once terminated in disaster. It will not be untimely, therefore, to offer a few suggestions as to the method of conducting such examinations, and the various sources from which more or less light may be obtained. This we shall do at an early day. On the present occasion we content ourselves with urging upon all persons engaged in mining, the duty of preserving as full and accurate records as possible of the work that is going on, either under their charge or within their knowledge. They cannot tell how soon such data may become of great value to themselves or others—and if to others, then also to themselves. Even negative experience is valuable. If all the abandoned and worthless mines were known, we should have no difficulty in finding those which are abandoned but not worthless.

The Society on the Stanislaus.

THE following gem, which we propose to add to the specimens of "scientific poetry" published from time to time in our columns, has been going the rounds for some time anonymously. It is from the graceful and masterly hand of F. BRET HARTE, editor of the *Overland Monthly*, and author of the best sketches of California life and manners that have ever made their appearance. Such trifles as this show but a single side of his accomplishments. It is in "The Luck of Roaring Camp," "The Outcasts of Poker Flat," and other prose poems, full of humor, pathos, and exquisite description, that his genius has most delightfully announced itself—unless, indeed, the palm be given to the book notices of the *Overland*, which manifest a subtle intuition of criticism, and a force of satire (where satire is called for) that are not excelled in contemporary literature. But we hasten to reproduce—

THE SOCIETY UPON THE STANISLAUS.

I reside at Table Mountain, and my name is Truthful James;
I am not up to small deceit, or any sinful games;
And I'll tell in simple language what I know about the row
That broke up our society upon the Stanislaus.

But first I would remark that it is not a proper plan
For any scientific gent to whale his fellow-man,
And, if a member don't agree with his peculiar whim,
To lay for that same member for to "put a head" on him.

Now nothing could be finer or more beautiful to see
Than the first six months' proceedings of that same society,
Till Brown of Calaveras brought a lot of fossil bones,
That he found within the tunnel near the tenement of Jones.

Then Brown he read a paper, and he reconstructed there
From those same bones, an animal, that was extremely rare;
And Jones then asked the Chair for a suspension of the rules,
Till he could prove that those same bones were one of his lost mules.

Then Brown he smiled a bitter smile, and said his greatest fault
Was that he had been trespassing on Jones' family vault;
He was a most sarcastic man, this quiet Mr. Brown,
And on several occasions he had cleaned out the town.

Now I hold it is not decent for a scientific gent
To say another is an ass—at least to all intent;
Nor should the individual who happens to be meant,
Reply by heaving rocks at him to any great extent.

Then Abner Dean, of Angel's, raised a point of order, when
A chunk of old red sandstone took him in the abdomen
He smiled a kind of sickly smile, and curled up on the floor,
And the subsequent proceedings interested him no more.

Then, in less time than I write it, every member did engage
In a warfare with the remnants of a palæozoic age,
And the way they heaved those fossils in their anger was a sin,
And the skull of an old mammoth caved the head of Thompson in.

And this is all I have to say of these improper games,
For I live at Table Mountain, and my name is Truthful James;
And I've told in simple language what I know about the row
That broke up our society upon the Stanislaus.

Zerah Colburn.

FEW writers on topics connected with engineering science have become more widely known and admired than the late brilliant editor of *Engineering*, whose untimely and tragic death we are called upon, in company with the whole professional public, to deplore. Mr. COLBURN died by his own hand in a village near Boston, away from his friends, whose sympathy and care might have prevented this terrible end.

His waywardness and his many and grave faults need not be recalled, even as a warning, at this time. No homily could be preached, so loud or so impressive, as the fact of such a death. Let us rather recall the good that he accomplished, vailing with the silence of charity the sad and evil parts of his career.

It is to ZERAH COLBURN, perhaps more than to any other man, that we owe the careful and intelligent comparison between American and foreign railroad engineering upon which a great deal of our progress has been based. The report which he made in 1858, together with that other engineer of equal ability and happier temperament, Mr. A. L. HOLLEY, on the foreign management of railways, was the beginning of great reforms in this country. His connection with various professional periodicals in both hemispheres, gave him opportunity to display both his excellences and his deficiencies—his wide and accurate knowledge, his keen perception and mechanical intuition, and, on the other hand, his impatience of control or opposition, his sarcastic and passionate manner in controversy, and his lack of steadfast, patient perseverance. In a word, he was one of those men of genius, whom the world wisely and charitably judges by the light of their own meteoric splendor.

Most men of talent are, fortunately for the race, like planets, pursuing their regular courses with even speed; but the comets of genius come and go in orbits difficult to follow, and suns that are self-luminous, serene and steadfast, are rare indeed—only one to each system. One of these greater lights COLBURN was not; and (to drop the figure) what he was is little to what he might have become under better self-control and discipline. Yet, in the words of a writer in the New York *Times*, ZERAH COLBURN was a man whom the profession could ill afford to lose. His thoroughly practical education in the work-shop, his extended observation of engineering works, his intimate acquaintance with professional literature, his remarkable quickness of comprehension, his more remarkable memory and his mechanical talent and inborn engineering ideas, combined to give him a distinction that no engineer in the world will deny him—that of the best general writer in his profession.

A "New" Calciner.

MESSRS. ROBERT OXLAND and JOHN HOCKING, of England, have announced a "new self-acting calciner, which they thus describe:

"This calciner consists of an iron tube, or cylinder, about four feet in diameter and thirty feet long, lined with fire-bricks placed on the edge, leaving an internal diameter of three feet three inches. It is set in an inclination of from a half to one inch per foot, varying according to the nature of the ores to be treated. On the outside, and fastened to it, are three iron rings, on which the tube travels over three pairs of rollers, by which it is supported. On the side of one of these rings are cogs, by which rotary motion is imparted by suitable machinery. The rate of motion is regulated by pullies of different diameters. The fire passes from the fire-place over a chamber, into and through the tube, and on into flues covered for a short distance with iron plates, on which the dammed ore is dried before it is admitted in a regular steady stream through a tube, into the back or higher end of the calciner. The slow revolving motion of the tube causes the steady advance of the ore by its own gravitation as it undergoes combustion, evolving sulphurous and arsenious acids, so that it is not brought into the sphere of action of the stronger heat until those constituents which cause the tendency to crust have been driven off: and the ore is consequently preserved in fit condition for the completion of the oxidation of its metallic constituents as it is gradually brought nearer the fire. In the interior of the tube are longitudinal projecting ledges, which lift the ore for some distance above the sole of the furnace, and then project it through the passing stream of heated gases. This constant perpendicular revolving motion is of the greatest importance, as every particle of the ore is kept constantly in motion, and is thereby brought in contact with the oxygen of the heated gases passing along the tube. The calcined ore is discharged in a continuous stream into the chamber between the fire-place and the front end of the tube. At the back end of the tube 'baffle' plates of fire-brick prevent any escape of ore into the flues."

The perusal of this description is enough to show that the apparatus is identical in almost every respect with the BRUCKNER cylinder, now used in Colorado. Perhaps this is another of those cases of "simultaneous inventions," into which our English brethren fall so easily, especially when the synchronism is what very critical persons might call a decided priority on the American side. We have met people in society who would listen to an argument or explanation until at last they caught the idea, and would then go away in the conviction that it was original with themselves. To very dull minds, the discovery that they understand a thing seems like the discovery of the thing itself. This is, perhaps, the most charitable explanation of a good many of these post-simultaneous English inventions. British inventors seem now and then to be in the position of the Irishman's horse, which, competing in a race, delighted his owner by "dhrivin' everything before him."

Fitting Locomotive Tires.

A CORRESPONDENT of the *American Railway Times* writes as follows: "If the turning of wheel and tire is well done, one-fourth of an inch is enough to allow for the expansion of a tire sixteen feet in circumference without the GRIGG's patent wood-packing—or, in other words, the tire should be turned out one-sixteenth of an inch less than the diameter of the wheel. The tire should be placed upon the face-plate of the lathe, with its inner edge out, and should be so clamped as to allow this edge to be partially faced off, for the purpose of affording a true guide to its position on the wheel. It is the practice in some shops in putting on tires to place the axle on end, or the wheels horizontal; in other shops the tire is put on while the axle is in a horizontal position. The former practice requires three rests to be adjusted to the rim of the wheel to hold the tire to its true position while cooling off, care being taken that the rests bear only on the turned portion of the tire. The latter is the handier practice, inasmuch as no rests are needed. And the wheel requires to be raised but slightly, just enough for the thickness of the tire to pass under. A temperature not far exceeding that of boiling water is sufficient to expand the tire so as to go on easily. Cold water should be applied at once to the rim of the wheel, to prevent expansion, and to bring the tire as rapidly as possible to a like temperature. The practice of fastening the tire to the rim of the wheel, by means of several bolts with long, tapering heads countersunk in the tire, should be abandoned. A much better method is to use three or four well-fitted inch set-screws through the rim of the wheel, corresponding cavities being made in the tire for their ends; the cavities should be at least three-quarters of an inch deep, and of uniform diameter to their bottom, and the ends of the set-screw should have a snug, straight fit, and should not quite bottom. This method leaves the tread of the tire perfect, as far as bolts are concerned.

The Slate Interest.

[Contined from page 289.]

quarries. It may be well here, before speaking particularly of the working of a quarry, to note the fact that there are, in all, upon this slate belt, eight mills engaged in the working up of slate-stock into billiard-beds, mantels, and the like. The largest of these is at West Castleton, and is known as the West Castleton Slate and Railroad Company. These mill companies, in many instances, are not the owners of quarries. They buy the stock in the rough from the hands of the quarrymen, produce therefrom and send to the market the manufactured article.

A large number of Welshmen have been brought over from the quarries in Wales, and are employed in these Vermont works. They are very successful in their works, many of them having come into possession of quarries which they carry on themselves, and generally with success, owing, perhaps, to the fact that they thoroughly understand the business. As a class, they make very quiet, industrious, thriving, and altogether desirable citizens in the community.

As yet, very little machinery is employed in getting out the slate from the quarries, or in splitting it up into sizes suitable for roofing purposes, though some attempts in that line are at present being made. Machinery is very extensively employed in finishing it for mantels and other purposes, as billiard-beds, table-tops, etc.

Of the amount of slate shipped from this section in 1869, we have been unable to obtain exact figures, very little care being taken to preserve them; they can only be obtained by consulting each station agent separately and going over the books. The approximate figures of 1868 are at hand, which we give, and they show the large extent of this comparatively young industry for the year ending December 31, 1868. From Poultney there was shipped 398 car-loads, or nearly 8,000,000 pounds, of roofing-slate, making, say about 13,000 squares. From Hydeville there went to the market 800 car-loads, or 16,000,000 pounds; of this, there were about 20,000 squares of roofing-slate, the rest consisting of manufactured products from the mills. The shipments from Fair Haven amounted to some 550 car-loads, or 11,000,000 pounds; and finally, from Middle Granville there was forwarded about 950 car-loads, or, stated in exact figures, 17,320,000 pounds.

Pennsylvania has immense deposits of slate, which are extensively worked. We represent their position upon the map by shaded circles. The largest and most northerly of these is that situated in Northampton and Lehigh counties. The great shipping points for this region are Slatington and Walnut Port. In these two counties, Northampton and Lehigh, there are some three hundred companies engaged in working slate quarries. South of this is the Peach Bottom region, in Pennsylvania and Maryland. It surrounds the point marked P. B. on the map. From these regions is supplied most of the slate that comes to tide-water. Slates from this part of the country are of a firm texture, split readily under the chisel, and are dark blue in color.

We should be glad to make this more particular, but are unable to do so from want of information.

Another slate region exists in Brownville, Maine, some forty miles north-west from Bangor. The slates obtained from these quarries are of a uniform black color, hard and durable. These quarries labor under the disadvantage of being some forty miles from railroad or shipping point. These slates do not usually come further west than Boston, on account of the great cost of transportation, etc. Several railroads are, however, in course of construction, which will give an outlet for this industry.

Colliery Accidents.

COLLIERIES are more liable to accidents than any other mines, not only because they are more exposed to the perils of conflagrating and exploding gases, but also because they increase more speedily in depth and extent. The value of coal is less in proportion to its bulk than that of any ore which can be worked with profit; and the size of the excavations in coal mining for a business of given financial magnitude, is proportionally great. Hence the problems of deep mining, connected with hoisting, drainage, ventilation, etc., have been presented to collieries for solution, in a greater number of instances, than those which metal mines can present.

A recent circular of Mr. HIGSON, an English inspector of mines, contains the following sensible remarks:

"It is with sincere and painful regret that I again call your attention to the great loss of life in and about the mines of this district, in the year 1869, particularly from explosions of gas and gunpowder, which has been greater in the last than in any preceding year or in any other district. That this has been promoted, and in many instances caused, by the ignorant and reckless use of gunpowder, by blasting without having first cut or nicked the coal on one side, by the firemen omitting to examine all places adjoining that in which the shot had to be fired, and by not seeing the shot-hole properly drilled and charged, there can exist no longer any doubt. It, therefore, appears to me desirable that, in all cases where practicable, the coal should be holed and cut on one side before blasting be attempted; that the shot-holes should be set out, charged, and fired by a competent person or persons; that in mines which emit inflammable gas, and in all pillar works, blasting should be strictly prohibited, if it can possibly be dispensed with. No gunpowder should be taken down the pit except in cartridges containing a proper charge, and no person should be permitted to take down the pit a greater number of cartridges than he is likely to require in one day. Before attempting to fire a shot the place, and those on every side adjoining it, should be carefully examined by a competent man. Only one shot should be fired at a time; and, before firing a second shot, another or second inspection should be made; and so in like manner after every shot has been fired. The gas which caused the explosion at Haydock colliery, on the 21st of July last, was said by some of the witnesses to have been driven by a fall from a hole in the roof; if so, it is necessary that all holes or cavities overhead should be ventilated; and, by a recent decision of the court, it is now rendered a cumpulsory measure. I have to request that all notices of accidents in and about mines be sent as soon after the occurrence as convenient, and that they may contain the age, occupation, and particulars of the casualty causing loss of life or personal injury. In addition to the foregoing suggestions for your future guidance, and those contained in my circular letter of January 1, 1869, which will, I hope, be properly observed, I have to exhort you to prohibit persons travelling on engine and self-acting planes, and provide wherever you can another road for the ingress and egress of the work-people."

It would be better, perhaps, if no gunpowder at all were used in coal mines. Coal-cutting machines, driven by compressed air, and man-engines on the German plan, for conveying workmen up and down the shafts, or at least safety-cages with parachutes to prevent diasters from breaking cables and safety hooks to prevent diasters from over-winding—these are modern devices which will sooner or later be deemed indispensable in large collieries. In this country there is no government inspection; but we would be glad to have our subscribers forward us accounts of all mining accidents, for future reference as well as immediate publication.

Seth Boyden.

THE death of SETH BOYDEN, the inventor, ought not to pass as one of the ordinary incidents of the day. Born in 1788, at Foxboro', Massachusetts, and married in 1814, he commenced his career in Newark, N.J., in 1815, with a leather-splitting invention of his own, which has been subsequently greatly improved. The next year he invented his cheap brad-cutting machine. Two years after, he began experimenting with leather varnishes, and brought out his "patent leather" in 1819, beginning, however, to sell it only in 1822. His sales that year were $4,621; in 1824, $9,703. He sold out in 1831.

All this was merely exercise for his inventive powers. He was to become famous in another line. He had his eye on the central industry of the world—Iron. He felt that there must be some mode of saving the great cost of making wrought iron; in other words, of turning cast iron cheaply into wrought. On the Fourth of July, 1826, he made his first "malleable iron," the first idea of which had come to him in boyhood, when he found that he could forge and draw a cast-iron brace which had been long subjected to the heat of a brick kiln fire. He sold out this invention, with his patent leather, in 1831.

We come now to the crowning effort of his genius, the invention of the *outside direct attachment* of the piston rod to the locomotive driving wheel to get power. A writer in the Newark *Advertiser* thus describes it:

"In 1835 he started a machine shop for the construction of steam engines. The Morris and Essex Railroad found its heaviest difficulty in the grade of 140 feet to the mile from Broad street to the summit of Quarry Hill, and it was proposed to place a stationary engine on the hill to raise the trains by traction. Mr. BOYDEN contracted with the road to build a locomotive which would do the work, and to the astonishment of almost all, accomplished it, and the first train over the road was drawn steadily and without difficulty over the hill by BOYDEN'S engine. It was, we believe, on this machine that he made a memorable improvement in placing the driving rod outside of the wheels. Imagine the old-fashioned engine, working underneath and turning a crank at a vast waste of power! BOYDEN threw the driving rod outside, made the wheel itself a substitute for the crank, and so gained the highest leverage, the most direct action, and the minimum of friction."

While in this shop he invented—as did others, probably, about the same time—the well-known "cut-off" of the steam engine.

It is said that he was the first to produce a daguerreotype picture in this country; but that has been said of several other persons. But he was constantly consulted by Mr. MORSE in the experiments which resulted in a perfect form of telegraph machine.

He discovered a way to make spelter, and also a way to manufacture that great secret, Russia sheet iron. But he could not compete in price with the foreign article.

He invented also an improvement on the Burr Hat Body Forming Machine, for which he took out the only patent for which he ever applied:

"A dozen others had tried to improve this machine, which is a wonderful combination of science, speed, cheapness, and convenience, and all had been enjoined by the United States Supreme Court, except one or two who were bought out by BURR. BOYDEN'S improvement stood the test in law, and after a tedious and expensive suit, in which he took small interest, the case was decided in his favor. This was in his old age, after he had passed his threescore years and ten, and seems to have been almost the only instance in which he cared at all who owned his inventions."

In 1849 he took the gold fever, and was a notably successful prospecter in California.

In the midst of his experiments on bronze, he died, March 31, 1870, aged 82 years, a truly illustrious and representative man; so gentle in his feelings that the proposition to kill a chicken or a robin for him on his death-bed filled him with indignation; simple in his wants; independent of all men; domestic in his tastes; modest to a fault; careless of money matters, yet never in debt; best loved by those nearest about him, and with his rough and rugged face, so full of earnest thought, unseamed by a single line of care.—*Philadelphia Railroad Register.*

The Mexican Mountain Railway.

AN enterprise of unusual difficulty, and without a parallel in some points, is the railway from Vera Cruz to Mexico. The elevation to be reached at the summit is eight thousand four hundred feet, and this actual height must be climbed from the ocean level in a distance of one hundred and fifty miles. The gradient is for great distances, as much as 1 in 25, and this with many and short curves. Comparing the actual elevation reached with the highest already constructed, we find it greatly surpasses them, while in no other case is the whole hill climbed, as in this case, from the very foot or ocean level. Thus the highest in Great Britain—the Caledonian—reaches to but one-fifth of this elevation; the Baltimore and Ohio railroad mounts to two thousand six hundred and twenty-six feet, and the summit of the Mont Cenis railroad is five thousand eight hundred and fifteen feet. The pass over which the Central Pacific railroad crosses the Sierra is less than seven thousand feet high; and the highest point on the Union Pacific also falls short of the Mexican railway mentioned. A recent number of the *Diario Official* of Mexico contains the subjoined account of the works of the company at Chiquihuite, one of the most formidable points of the entire undertaking: "After leaving the station of Paso del Macho the road passes, by means of a bridge three hundred feet long and one hundred feet high, that immense neck of land which separates the base of the first level portion of the Cordillera from the plains of the *tierra caliente*, or the hot country. This bridge, the mason work of which is entirely finished, only lacks the iron floor in order to be opened to the public. Having passed this great work, we arrive, by a series of curves as boldly as scientifically run, at the great bridge of San Alejo, which is not as high as that of Paso del Macho, but several feet longer. From San Alejo to Chiquihuite there is nothing but deep cuts through the solid rock, and enormous embankments, making the great inequalities of that broken ground entirely disappear. Chiquihuite bridge, which is over three hundred feet long, is elevated more than one hundred and fifty feet above that abyss, where the foaming cold stream that gives its name to this part of the mountain forever leaps and boils. The boldest spirit would not suspect the real *tours de force* conceived in the running of this road accomplished by the skill of Mr. BUCHANAN, and completed under the direction of Mr. BRANIFF, chief of construction. On leaving the bridge the road follows the main highway for some distance by an embankment of sixty feet high, supported by a wall ten feet thick, and suddenly, as in the shifting of scenes in a theatre, the road runs around the mountain, suspended on its sides. It was necessary to cut it through solid rock, of which the side of this mountain is composed. The laborers engaged in this unequalled piece of work have to hold on to the rocks, and are held up by ropes, which makes them resemble at a distance bees in a honeycomb. The road continues for about one hundred metres along that tract before it enters the first tunnel of one hundred and fifty feet in length; it again reappears only to continue its aerial route, and again disappears in a tunnel of three hundred and fifty feet. From this tunnel the road passes over a small iron bridge, raised eight hundred feet above the bottom of the ravine."

The New Elevated Railroad.

NEW YORK, May 4, 1870.

TO THE EDITOR: Sir—In your article on my elevated railroad, published May 3d, you say: "Light freight has been transported in a manner similar to that proposed by the inventor by using a single inclined wire supported from the arms of wooden columns some fifty feet apart, on which small box-cars run, suspended from grooved wheels. This plan has been used to great advantage," etc., etc. In the manuscript sent you, I wrote, "Light freight may be transported," and "this plan may be used," etc. It is not new to use a wire inclined in one direction between two points, and to draw the car up again by stationary power, nor is it new to run cars by stationary power on a horizontal wire, and it was probably to one of these systems you referred; but mine is quite different, contemplates the use of gravity as power in both directions, getting the necessary fall by elevating, and supporting the wire at short intervals from branches connecting with the columns. This system has not, to my knowledge, ever been used, and I therefore ask that, to set me right on the record, you will insert this in your valuable journal.

Yours respectfully, ROBERT A. CHEESEBROUGH.

The Chanda Coal Fields.

THE Earl of Mayo has recently inspected the coal fields of Chanda, from which so much is promised in the future. One of the coal pits examined is about one hundred and twenty feet deep; it is lined with masonry for some fifteen feet, then it drops through the solid sandstone for about forty-five feet; at this point a coal seam four and a-half feet thick is reached; then comes a band of clayey stuff twenty feet thick, and after that twenty-eight feet of coal. On His Excellency's arrival at the pit, the only English lady in Chanda stepped forward, presented him with a miner's pickaxe, and asked him to declare the Mayo Colliery open. The pick was a Chanda product; its iron was Chanda iron worked with Chanda coal, its shaft was Chanda teakwood bound with Chanda gold, and the device upon the pick was ornamented with Chanda gems; the whole was carved tastefully by Chanda workmen. He then went down the pit with Mr. MARK FRYAR, the mining engineer, to whose knowledge and energy the forward state of the work is mainly due. After the Chief Commissioner and Major LUCIE SMITH had also descended, his Excellency struck the pick into the coal, knocked out a lump, and declared the work commenced. —*Indian Daily News.*

Titanic Iron.

ILMENITE, or titaniferous iron, has been mined more or less in Norway for some time, and brought to England for fettling puddling furnaces, for which purpose it is especially adapted. But this did not pay, and as chemists have failed to smelt it, except at too much cost, the mines were given up. Recently, attempts were made to make bricks with this ore in combination with fire-clay, for the purpose of lining furnaces. Some of the prepared bricks were placed on the bridge of a furnace to try them, but as soon as the ingredients of the clay were reduced, the bricks disappeared. Here was a clue to the flux required; and now the ore is regularly smelted, producing a remarkably fine kind of iron.—*Journal of Franklin Institute.*

The "Oneida" Disaster—The Divers at Work.

THE Yokohama correspondent of the Sacramento *Union* gives the following graphic sketch of the descent of the divers to the wreck of the ill-fated "Oneida:" "On the 24th day of February, the 'borrowed' steamer 'Aroostook,' with CHARLES and J. S. LOUGEE, practical and experienced divers from San Francisco, went to where the 'Oneida' lies, in 123 feet of water. After the usual preparations had been concluded, and, by sounding, it had been ascertained that the deck of the 'Oneida' was 103 feet beneath the surface of the bay; after every caution had been given to eight strong sailors to keep the air-pump in constant motion, and allow not an instant of stoppage to occur, as thereby depended the life of the bold diver; after CHARLEY LOUGEE had been helmeted, and shut from air, except that supplied through that slender tube of coiled rubber, with a life-line around his body, and leaden clogs to his feet, with 'Good-bye' and 'God bless you' from all aboard, he was dropped over the side, and slowly disappeared in the blue waves, while a nervous tremor shot our frame as we realized the fearful risk undertaken by that man who was seeking for truth in over one hundred feet of water. Away to leeward, borne by tide and wind, came floating bubbles to the surface—life-signals from below. The men at the pump labored manfully, but becoming fatigued, attempted to change for fresh hands, and there was a stop. 'Great God! you will murder my brother! Quick! for Heaven's sake, quick!' And as the men now commenced the revolutions of the air-pump, the elder LOUGEE, with blanched face, and trembling lip, gave a signal on the life-line below. For an instant there was no response, and the face of that brother seemed to turn to marble; but then we saw two quick motions from the submarine station, and knew it was the welcome signal of 'all right,' and then LOUGEE turned to the men at the wheel, who came so near sending death below, and simply said, 'My only brother's life depends upon your efforts in keeping that pump constantly in motion—stop again at your peril!' The calm face and passionate eye told those men not to stop again, and, with Lieutenant TANNER close by, they kept at work until stopped by orders from LOUGEE. Meantime, while we were on the deck of that 'sand-pan,' counting the tedious moments which lengthened to half an hour, CHARLEY LOUGEE was searching the 'Oneida' at the tremendous depth mentioned. At last came the signal for 'surface,' and instantly the life-line was put in motion; slowly came the coiling hemp and rubber on deck, and at last, away in the deep blue waves, came in sight the diver, shrouded and panoplied in weird garments. As he came to the surface, he reached Minister DE LONG a sword and a lacquered box, and then was his helmet loosed, and our party crowded around to hear of the gallant ship. Among our party were many of the survivors of the 'Oneida;' among them were WILLIAM CROWNINSHIELD, Captain CLARK, Master YATES, and DR. JAMES SUDDERD, who were intensely excited to learn the tidings. Said the diver: 'The water for the first seventy feet was quite clear, as the sun gave excellent light, and although my supply of air was once choked for an instant, I reached the deck of the ship just astern of the mizzen-mast, and close by the mess-room hatch: the tide was ebbing quite strong, and I was compelled to hold to lines from the rigging to keep from being swept forward. I first examined the side of the ship; she was cut from the mizzen rigging (at an angle of about forty degrees) across the whole stern of the ship; her timbers, far below the water line, being crushed and broken; the captain's cabin cut in two; the wheel and steering gear all carried away; and, in fact, the whole side and end of the ship stove in or cut away. The ship is heading southwest, and sits upright on the bottom, and is making sand slowly. I laid down on the deck, and peered over the broken end into the cabin, but did not dare trust my air-line in contact with the jagged timbers. The guns and armament, except one, are all in place aft; but I did not go forward, as I was afraid of entanglement in the rigging.' Turning to CROWNINSHIELD, he said: 'Your evidence, which I read, described almost exactly the injury, except that she was cut deeper than you could have known.' LOUGEE expressed the belief that it will be impracticable to raise the ship, but that the splendid battery, personal effects, etc., can be saved if the Government sees proper. By this survey, the testimony of the living is verified, and the memory of the dead without a stain, for the position of the ship, as found, and the positions of both the 'Oneida' and 'Bombay,' as testified to by the navigating officers, show that it was impossible for the Captain of the 'Bombay' to have ever seen the red light of the 'Oneida,' and that the order of 'Port your helm,' by Capt. EYRE, was wrong, and the 'Starboard, hard a-starboard' of Master YATES was right. Here we bid adieu to the 'Oneida' and her attendant train of saddened memories. By the same ship which bears this letter, her surviving men and officers will go to San Francisco; their loved companions and shipmates lie deep in the fastnesses of the Japan Sea."

Progress of the Surveys of the North Pacific Railroad.

FROM the Minneapolis *Tribune* of April 10 we take the following:

"GEORGE A. BRACKETT, who started from this city March 11, for Hinckley and beyond, to push the transportation of North Pacific supplies, and who was to be gone four days, arrived home on Friday evening. The delay in Mr. BRACKETT'S return was caused by the necessity at the scene of action of his personal attention to the work going on. Men and teams had to be employed, equipped and sent forward. He made a base of operations at what is called the 'junction,' near the point where the Northern Pacific will cross the Lake Superior & Mississippi Railroad, two miles below the Dalles of the St. Louis River, about sixty miles below Hinckley.

"The extension of the construction of the latter road, which has been going forward all winter, and the enormous quantities of freight, etc., required to be removed to Duluth and Superior, has made strong competition for teams and men. Exorbitant prices have been paid to procure them. But this department of the work was only preliminary. Swamps had to be bridged, corduroyed, and timber cleared away sufficient to allow the passage of the supply trains.

"The line of stations extends from the 'junction' to the Mississippi River east, *via* Perch Lake and Sandy River, are located on what is known as the centre line running from the 'junction' to the points above named to the Mississippi River to a point about one hundred miles above Crow Wing. This line was run the past winter by Capt. T. L. ROSSER, who is represented to be a man of extraordinary energy and perseverance, and whose work, owing to the condition of the country, has been of the roughest and toughest kind. He is a graduate military engineer of West Point. The last station, No. 6, is located on Sandy River, and communicates through Sandy Lake by water with the Mississippi. Capt. ROSSER'S headquarters are now at the 'junction,' and he is organizing his forces to continue the work already begun on the located line from that point.

"There are depots of supplies at Gull Lake, north of Crow Wing, containing 200,000 rations; at Otter Tail, 140,000 rations; at Crow Wing, 75,000 rations. These will be moved forward to the line of the road as soon as its permanent location is determined. On this line, from the 'junction' through to the Mississippi, there are 200,000 rations. His work for the present is partially concluded, but only for a short time.

"The men and teams arrived in this city last night, and the stock was taken to the Fair Grounds, where all the arrangements have been made to care for the horses and camp equipage until it shall be needed again. He expresses the highest enthusiasm existing among the men under his supervision, and that they have driven the work with the same energy as if it had been their own.

"Mr. KIMBERLEY, who had charge of the Hudnutt party after they left the Mississippi River for Otter Tail, is now in St. Paul. W. A. SMITH'S party, who run the line from St. Cloud *via* Lone Prairie, to Otter Tail, is now at Otter Tail, waiting till such time as they can continue the survey on the Red River. Messrs. SMITH and KIMBERLEY are now in St. Paul making up their reports.

"Gen. SPAULDING left on Monday last to lay before the Board of Directors at New York the result of the surveys that have been made, and their decision in regard to the line will be known in a few days.

"BLAKELY & CARPENTER'S stages have had superhuman difficulties to overcome, and their line is now almost suspended between Delchu and Hinckley, owing to the wretched condition of the roads. Passengers can go no further at present than that point, and a large amount of express matter is delayed there. The stage company will keep on until they succeed in making connections.

"There was but little sickness, and the party arrived last night, all looking well."

Property of Amorphous Silicic Acid of Absorbing Moisture from the Air.

IT is reported that Dr. Lippert, while assistant to Professor R. Fresenius, made the observation that amorphous silica, after having been strongly ignited in a platinum crucible, attracted moisture from the air to a large extent; in consequence whereof, and to test this fact precisely, a series of experiments has been instituted from which the following results are drawn:—Amorphous silica is always hygroscopic after ignition; the degree of hygroscopicity differs greatly, according to the degree of heat the silica has been ignited—so that feebly-ignited silica is far more hygroscopic than when strongly ignited. When silica has been only feebly ignited, its avidity for the absorption of water, even after the lapse of a few minutes, is so great as to cause, if not taken into account, serious faults in the weighing and quantitative estimation of that substance. Crystalline silica, even when feebly ignited, is not at all hygroscopic.

The Size of Atoms.

SIR WILLIAM THOMPSON, who contributes an important paper on "The Size of Atoms" to a late number of the *Nature*, thus sums up: "The four lines of argument which I have now indicated lead all to substantially the same estimate of the dimensions of molecular structure. Jointly they establish, with what we cannot but regard as a very high degree of probability, the conclusion that in any ordinary liquid, transparent solid, or seemingly opaque solid, the mean distance between the centres of contiguous molecules is less than the hundred-millionth, and greater than the two thousand-millionth of a centimetre. To form some conception of the degree of coarse-grainedness indicated by this conclusion, imagine a rain-drop or a globe of glass as big as a pea to be magnified up to the size of the earth, each constituent molecule to be magnified in the same proportion. The magnified structure would be coarser grained than a heap of small shot, but probably less coarse grained than a heap of cricket balls." The importance of this conclusion can hardly be over-estimated.

Meteorological Observatory at Montsouris.

To this institution, established by M. C. Sainte-Claire Deville, a grant of £2,400 has been made by the French Minister of Public Instruction for the current year, with the arrangement that the peculiar work to be done has to comprise—(1) The complete study of all the facts relating to the climate of Paris, and the observation of the phenomena of physical interest pertaining thereto; (2) the calculation and digestion of the older observations on record; (3) the collection and redaction of the daily observations made in France and abroad, as far as they are published or transmitted daily by telegraph; (4) the daily publishing of all the results of observations made.—*Les Mondes.*

MISCELLANEOUS.

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1st. One hundred and twenty-nine first-class areas, numbered as follows, viz: from 51 to 61; from 140 to 161; 243 to 258; 343 to 359; 438 to 463; and 558 to 550, all inclusive, in the original block; and from 395 to 406, 495 to 506, all inclusive, in block No. 5. Many veins have been discovered on this property, all gold-bearing, but only two tested. One of these is a continuation of the vein discovered on the opposite side of the lake by Messrs. Waddelow, from which the present proprietor, James Carson, Esq., of New York City, has taken perhaps the richest rock that has been found in the district. It has been sunk on about 15 feet, a few tons of quartz raised, and a test gave 16 dwts. ($16) to the ton. The other vein tested is fed by twelve tributary veins, and two shafts sunk on it, one about 45 and the other about 112 feet deep. In the first gold was struck at 35, and in the second at 55 feet deep. A test at the Montague mills gave a few grains over one ounce to the ton, and the last rock taken from each shaft was the best. In parts this vein is very thick, at the thickest only the width of the shaft (5 feet) being taken out. There are other feeders or tributary veins that will come into it at a still greater depth, one of them, 5 feet thick, will come into the seam at 180 feet depth.

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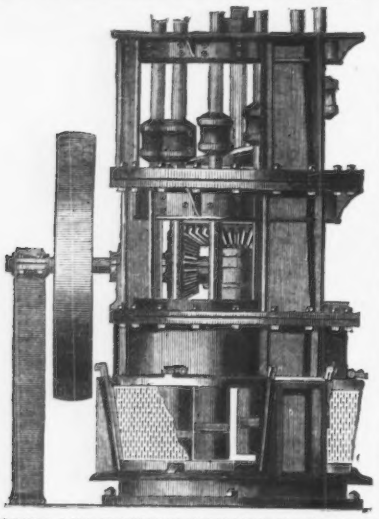

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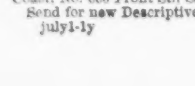

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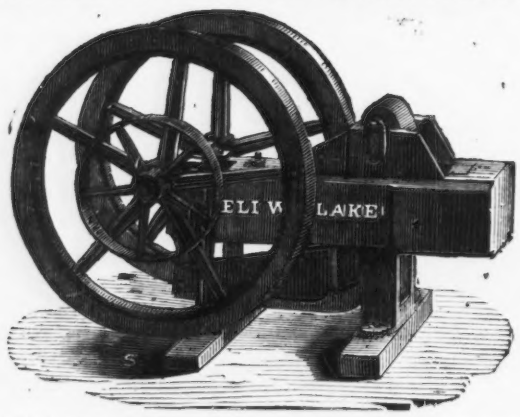

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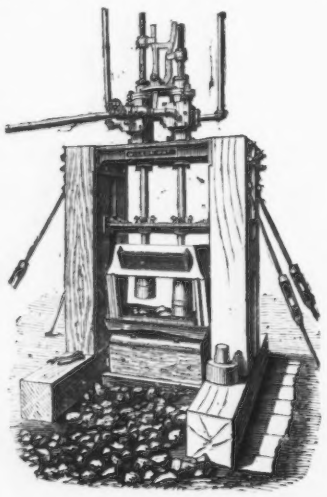

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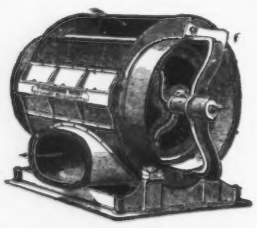

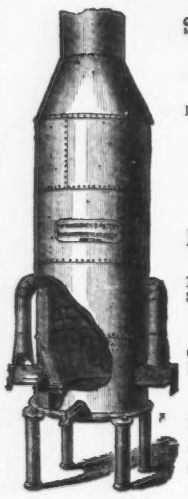

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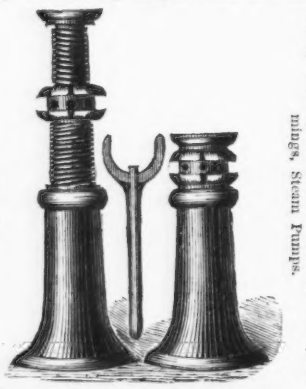

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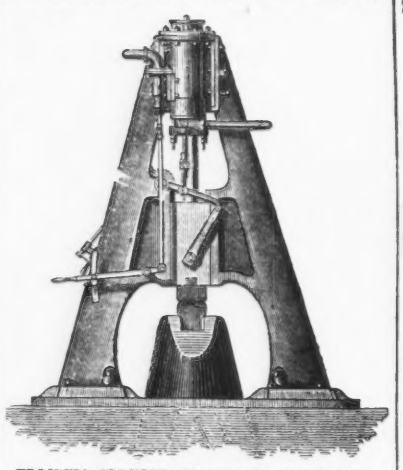

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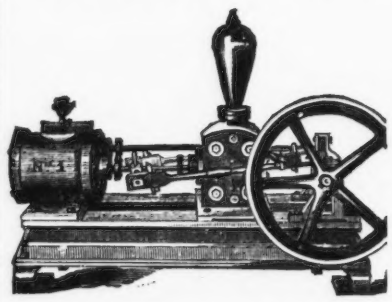

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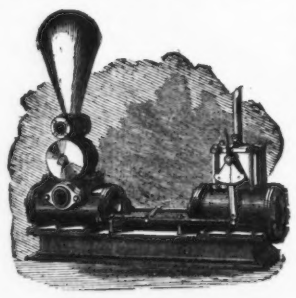

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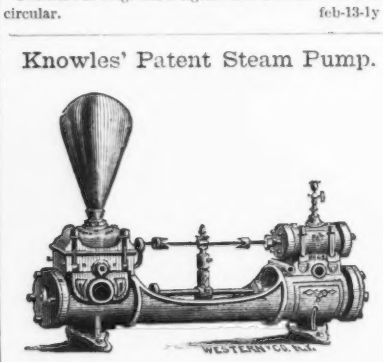

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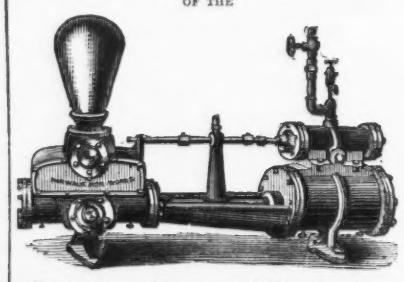

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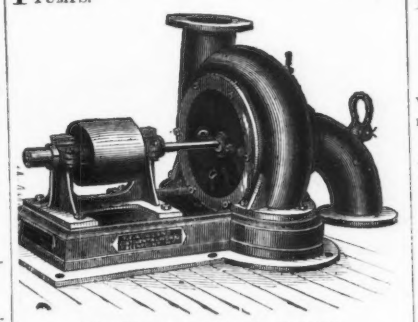

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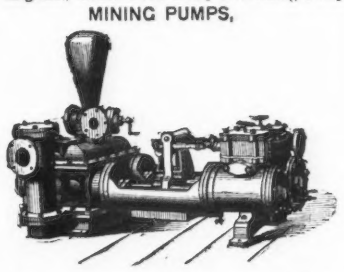

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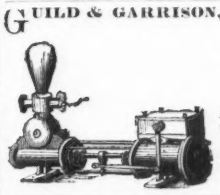

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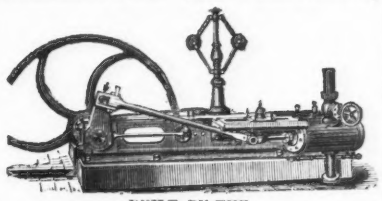

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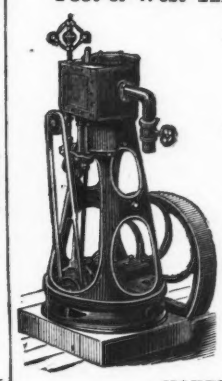

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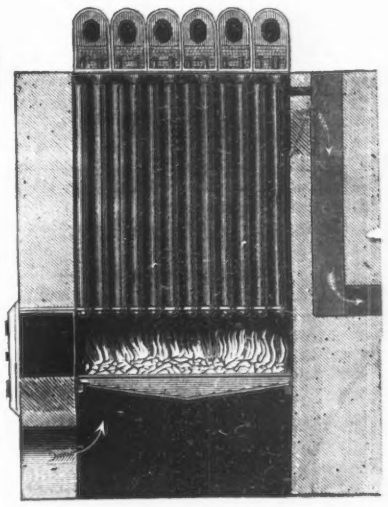

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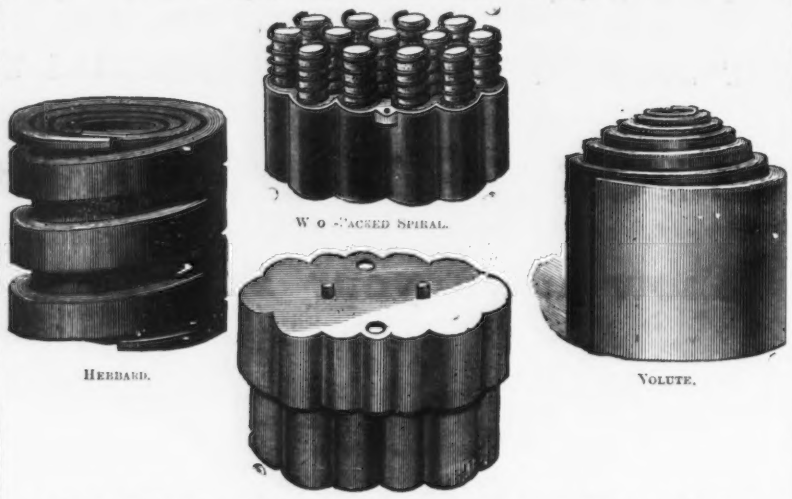

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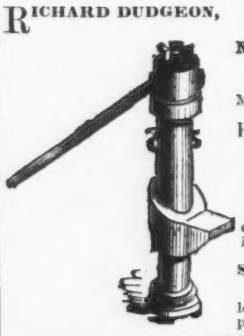

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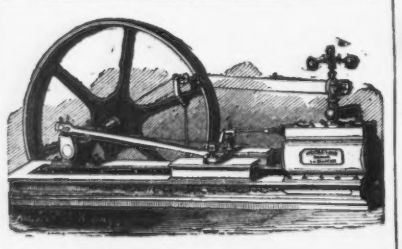

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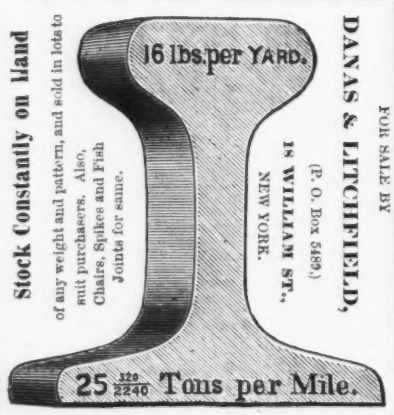
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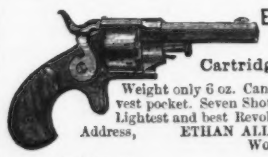

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